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REPORT ON A FATAL DISEASE AMONG GOATS IN THE DISTRICT OF KHANDEISH.

BY JOHN HENRY STEEL, PRINCIPAL, BOMBAY VETERINARY COLLEGE.

In a letter dated 7th May, 1889, Mr. P. R. Metha reported fatality among goats of the Government flock on the Bhadgaon Farm, which he considered to be due to Pneumonia, and which he stated to be very common in the neighbourhood of Bhadgaon. Treatment seemed to have no effect. The Government flock of about 45 she-goats, 3 he-goats, and 6 kids was purchased for 112·12 rupees, in the months of February and March, at markets in different parts of Khandeish. It is supposed that the disease was brought by some of the animals then purchased. On each of the following days a she-goat died, 17th, 23rd, and 30th of April, and 7th and 8th of May. These animals had been subjected to treatment, consisting of administration of ammonia and ether internally, and application of stimulants to the chest externally. Finding this treatment ineffectual, Mr. Metha very judiciously decided to sell the animals to the butcher directly they were noticed to be affected. Thus from the 8th to the 18th of May nine animals were disposed of in this way at an average price of a little over two rupees. Of these one was a he-goat, and it was specially noted that no kids were affected. Two births in the flock and the above-mentioned 14 fatalities reduced the strength to 32 she-goats, 2 he-goats, and 8 kids on 18th May. Enquiries showed that casualties among sheep stock on the farm since 1882 have been in the proportion of 30 per cent. to the strength, according to

the following table extracted from the annual reports of the farm :—

Kind of Sheep.	Strength.						Losses.						Remarks.
	1882	1883	1884	1885	1886	1887	1882	1883	1884	1885	1886	1887	
Dumba ewes..			9	3	3	3			6*	...	...	...	*In lambing.
Country ewes			35	31	49	41			2	4	10	12	
,, yearlings			...	...	?	...			...	...	16	...	
Cross ewes ...			26	70	88	90			...	7	4	16	
,, rams & wethers			33	24	22	23			4	6	6	18	
,, yearlings			27	24	28	50			...	...	9	22	
,, lambs ...			60	6	21	8			8?	19	19	2	
Goats			13	10	17	22			2	...	2	6	
Total	85	181	203	168	230	237	38	93	22	36	57	76	
Average ...	184						53·67						
Percentage	...						29·1						

The losses thus specified are under all headings, but it seems probable that the disease under consideration contributed to the list in no slight degree. The shepherd in charge of the goat flock knew the disease well, although he failed to recognise the cases at very early stages. The mutton butchers of Bhadgaon were quite familiar with the characteristic *post-mortem* lesions, and it was ascertained on enquiry that the disease, which is known distinctively as "rog" (namely, *the* disease), causes considerable ravages among the sheep and goat flocks of the Dongras, who traverse the district with sometimes as many as several thousand sheep, forming flocks which are hired by agriculturalists for manuring their grounds. It is said that four or five thousand sheep and goats belonging to one owner have in one season been carried off by the disease, and that in this way several wealthy men have been ruined. Thus it is evident that disease among goats is prevalent and wide-spread, and requires serious consideration, as being a source of such loss to the community. It is supposed that calves sometimes suffer from it, but the evidence as to correctness of this view is very imperfect. I did not see any cases among sheep, but there seems ample evidence that it affects them as well as goats. It occurs in adult animals of both sexes, and appears to be quite independent of season, the general view being that it depends upon contagion only. That the disease is Pleuro-pneumonia is sufficiently evident from *post-mortem* examination, and that it is specific is evident from one side of the chest only

being affected, from the disordered condition of the blood, and from the *post-mortem* lesions in general. Whether it is the same disease as specific Pleuro-pneumonia of cattle, or whether it is merely a close ally of that disorder, remains to be seen. I think the latter view more probably correct, as we have no evidence of adult cattle on the farm taking the disease, which would be the case probably were it communicable to them. The symptoms and *post-mortem* appearances are very similar to those of "Pleuro" in cattle. They can best be illustrated by the following cases, which especially received attention from me:—

Case 1.—Supposed to have recovered from attack, but still kept apart from the flock. Temperature 103·1° in the evening; coughed freely when handled, and had a slight discharge from the nose.

Case 2.—A she-goat supposed to have recovered from an attack, and which had been grazing with the rest, was observed to have a difficulty in keeping up; suffered from paroxysmal cough, had discharge from nostrils, and was extremely emaciated, although the coat looked glossy, and the eyes bright and glistening. The mouth was pale; pulse 80; evening temperature 104·2°; morning temperature, 103·8; conjunctiva somewhat bronze-coloured; anus dry and hot. Two kids were running with this patient, and they looked well, but they must have got their sustenance from elsewhere. The lung-sounds were lost on the right side, and pressure on the intercostal spaces seemed to pain the animal. It is evident that the recovery in this case was simply an improvement in the appearance of the animal, when the attack, after being acute, commenced to assume the sub-acute form. She was slaughtered for *post-mortem* examination, and the carcase sold for 1·8 rupees. Autopsy immediately after death showed abdominal organs healthy, with the exception of the spleen, which weighed 6½ ozs., and was rather firm in consistency. The liver was somewhat pale, and weighed 1 lb. 7 ozs. The disease was confined almost entirely to the right side of the chest, the pleural cavity of that side being obliterated by adhesion, except at the extreme infero-posterior part, where was accumulated an amount of clear serous fluid, which distended the remainder of the cavity, and coagulated like size into a greenish opalescent mass after removal from the body. The endocardium of the left side was congested; the left lung healthy. The right lung was consolidated, except at the extreme anterior part, of a greenish metallic colour on the surface, quite useless for all practical purposes, exhibiting from before backwards the following characteristic appearances:—

(*a*) Congestion.

(*b*) Thickening of the pleura and of the parenchyma, also nodules, probably due to accumulation of pus in the air-cells.

(*c*) This condition exaggerated.

(*d*) Grey hepatisation, or nodules in a state of suppuration.

(*e*) Parenchyma undergoing cartilage-like thickening, encroaching on the hepatised portion, until

(*f*) The whole tissue becomes a cartilage-like mass. This lung weighed 28 oz., whereas the left weighed only 6 oz. The total weight of the carcase was 38 lbs.

This case seems to have illustrated well the disorder in its sub-acute or advanced stages.

Case 3 was brought in from the neighbouring village of Vadji. The temperature was found to be 103·4°.

Cases 4 and 5 returned to the flock as recovered some days before; each gave a temperature reading of 103° (normal).

Case 6 was first noticed as sick on the morning after my arrival. It was suffering from acute fever, and gave a temperature reading of 106·2°. There was cough, slight nasal discharge, pale mouth, pink or bronzed conjunctiva, dry nose and anus, bright eyes, glossy coat, modified lung sounds, and quick pulse and breathing were present in this as in other cases. The animal was forthwith slaughtered, and autopsy showed the carcase in excellent condition, weighing 56 lbs. when dressed, and sold for 3 rupees; spleen 8 oz. in weight, and slightly nodular. The liver was congested somewhat, weighed 2 lbs. 4 oz., and showed small local patches of hepatitis. The right lung weighed 9 oz.; the left in this case was the seat of disease, and weighed 19 oz. The blood was normal. There was no fluid in the chest, but slight local Pleuritis, also a little sub-endocardial extravasation; the trachea was markedly congested, and the bronchi also, their passages being filled with froth and phlegm. The left lung was consolidated, especially in its posterior division, its surface being of a greenish colour, and presenting a number of blood-spots, varying in size and tint. This case well illustrates the disease in its acute phase. Microscopic examination of the blood with 1-5 in. power led to no detection of organisms in that fluid.

Evidently the disorder is a specific Pleuro-pneumonia, but such a disease is unknown in Europe, except that M. Duquesnoy, in the Lyons *Journal de Zootechnie*, has quite recently described a contagious Pleuro-pneumonia in goats, in which he found on *post-mortem* examination both lungs hepatised with adhesions, and effusion into the right pleural sac, also the lung-sections marbled, and of various colours; the pericardium congested, and the cardiac serosa ecchymosed. The symptoms showed by the affected animals were frequent and deep cough; abundant and gummy nasal discharge; lactation, rumination, and feeding suppressed; respiration difficult and painful; skin dry and warm; eyes sunken

and watery; conjunctivæ injected; mouth warm and congested; breath offensive; pulse 120; temperature 103°; diarrhœa, with fœtid and greenish evacuations; a dull sound on percussion, and pain on pressure of the chest; emaciation. The period of incubation was estimated at four days.

This outbreak seems to have rather closely resembled that in Khandeish, but differs from it in some respects, notably in the presence of diarrhœa, and in both lungs being affected. This does not prevent it being the same disease, however, because geographical conditions materially alter manifestations of a disorder.

In the VETERINARY JOURNAL, No. 13, 1881, p. 171, is a report on Contagious Pleuro-pneumonia in Angora goats at South Africa, by Mr. Duncan Hutcheon, veterinary surgeon for Cape Colony. This disease was indicated by cough, a tendency to lie down, to lag behind the rest of the flock, the animal being off feed only in the advanced stages, and giving a peculiar grunt between each mouthful of food. In severe cases there was a grunt at each expiration, and the animal lay down with one fore-leg stretched out, the tongue protruded, mouth open, and a flow of frothy saliva from it, a distressing bleat, and temperature 105° to 107°. Autopsy showed small, pea-shaped, light yellow nodules, with a port-wine coloured ring around each, one-third to one-eighth inch in diameter, sometimes in one lung only, and diffused irregularly throughout the lung substance, especially predominating in the posterior part. As these enlarged and coalesced they rendered the lung solid. The Pleura-pulmonalis was at first affected only over the nodules, later the whole became blue and thickened; little fluid was found in the pleural cavity, but much in the pericardium. The endocardium was petechiated, and the lungs were sometimes adherent; the serous fluid coagulated firmly on standing. It was found that when the pleura was most affected the disease proved most fatal; also that the weather influenced its progress and fatality. About one-third of the affected recovered, but how long a time should be allowed before recovered animals might safely mix with the unaffected was not ascertained. The disease was distinctly contagious, the period of incubation being put at ten days, although eight days after mixing with the sick, six goats became dull and feverish. No lesions were detectable, *post-mortem*, until the tenth day. Neither sheep nor cattle could be made to take the disease, although this point as regards sheep seems not to have been conclusively settled. Native goats took the disease from the imported Angoras. Drenching with lung-tissue, pleural fluid, and water, mixed and strained, did not cure or prevent the disease; inoculation was equally ineffectual. The

flesh when eaten did not cause any disease of man or other animals.

Treatment.—Curative measures proved ineffectual, although quiet, laxatives, and diuretics were supposed to hasten natural recovery. Isolation and disinfection or prompt destruction of the sick cut short the outbreaks.

The disease thus described by Mr. Hutcheon closely resembled that studied in Khandeish, but presents a few interesting and suggestive points of difference; these possibly are the outcome of difference in geographical range.

In Morocco a virulent Lung Disease of goats prevails, and is termed "Bayoor;" it does not attack sheep. Prophylaxis is said to be effected by placing a piece of diseased lung in a slit made in the ear of an unaffected goat, and subsequent slight cautery (VETERINARY JOURNAL, Sept., 1887).

Finally, we must consider a few practical points with regard to this disease:—

1. How may it be most simply and practically diagnosed in the earliest stage? Elevation of the internal temperature (as detectable by the thermometer) is apparently absolutely the earliest symptom; but for practical purposes it is sufficient if the shepherd be given orders to at once isolate and report any animal which coughs, discharges from the nose, has discoloured eye-membranes, seems unable to keep up with the rest of the flock, or goes off its feed.

2. What is the best treatment practicable at the Bhadgaon Farm? (*a*) Close supervision, with a view to early detection of case; (*b*) prompt isolation of sick and suspects; (*c*) segregation for at least fourteen days of all freshly-purchased animals; (*d*) thorough disinfection of any sheds occupied by the herd, or penning them at nights in the open with frequent change of site of the pen; (*e*) continuation of the system of prompt slaughter and sale of animals directly they are found to be diseased.

Great care should be taken with a view to isolation, for at least two months, of those goats which have apparently recovered. A most interesting and valuable series of experiments might be made with a view to prophylactic inoculation. Mr. Methan's veterinary experience and studies at Cirencester render him fully competent to conduct such experiments, if he has time available, and I shall be most happy, in that event, to explain to him what experiments should be made, and the precautions necessary in carrying them out, in order to procure sound results.

I consider that the prevalence of this disease is not a sufficient cause for cessation of the most interesting experiments on goat-rearing which are being made at Bhadgaon Farm, for I think that

rigid enforcement of repressive measures, especially with a view to prevention of reintroduction from without by fresh purchases, will suffice to keep the disease well under control. Also, fortunately, the people in Khandeish constantly eat goat mutton, and prefer it to that of sheep, which they consider not strong enough. Consequently there is a ready sale for carcases, and, as we have seen, these are in good order, and bring full price if the goat be destroyed in the earliest stage of attack; while such evidence as is to hand tends to the view that no ill-consequences to mankind are likely to result from ingestion of the flesh of animals suffering from this disorder.

A MOLE IN THE MARE.

BY J. BRETT, M.R.C.V.S., MANSFIELD WOODHOUSE, NOTTS.

As anidian monsters are so seldom met with in the mare, the following facts may interest veterinary readers:—

The animal, a shire cart-mare, had run within a month or six weeks of her full time, the gestation up to that period appearing normal, when she was noticed to show symptoms of uneasiness, as though parturition was about to take place. These continued for several days, and were succeeded by violent expulsive throes. After many efforts, a hollow bony body, about the size of the adult human skull (which it very much resembled) was voided. Considerable hæmorrhage followed, laceration of the passage, and retention of portions of membrane retarded recovery.

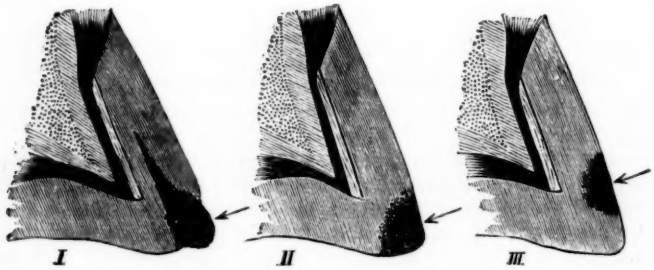
The "abnormality," the shape of which is described above, was full of clotted blood, and covered by a thin membrane, several inches of the umbilical cord remaining attached about the position of the occipital crest; depressions resembling the orbits and mouth occurred on the opposite side. I had some difficulty in convincing the owner of the mare that his suspicions, which it is needless to mention, were groundless.

EXTERNAL SEEDY TOE.

BY J. A. NUNN, F.R.C.V.S., F.R.G.S., ARMY VETERINARY DEPARTMENT, BARRACKPORE, INDIA.

This condition of the foot of the horse to which I have applied the above designation, for want of a better, appears to have escaped general notice, but as far as my experience goes it is not by any means rare, at all events in this country. As far as I have been able to determine, there appear to be three varieties. In the first the disease commences in the ordinary internal manner,

progressing upwards between the two tables of horn, and at the same time outwards; but the morbid process is faster between the horny tables than outside; in other words, the height to which the disease extends is greater internally than externally, as is shown in the diagram of a section of the foot No. 1. The second variety commences outside the horn, at the plantar surface of the toe, and extends upwards and inwards, as is shown in the diagram No. 2; and the third appears anywhere between the coronet and the ground, gradually extending into the substance of the horn layers, as in No. 3. In the latter case the progress appears to



be faster in a downward than an upper direction, but I am inclined to think this is more apparent than real, as the rate of growth of the horn downwards would detract from the progress of the disease upwards, although it spreads over the horn at the same rate. That it has not attracted much attention is, I take it, from the fact that it is noticed from its very commencement, whereas internal seedy toe is not; but amongst animals not well cared for this condition of the foot has come under my notice.

P.S.—The drawings are only ideal diagrams, not sketches from nature.

ANEURISM OF THE AORTA.*

Etiology.—The causes of enlargement of the aorta are mostly due to displacements of this vessel caused by chronic endarteritis and mesarteritis, accompanied by fatty and calcareous degeneration. Aneurism of this vessel may be also produced by the presence of the strongylus armatus, or by that of the spiroptera sanguinolenta. It may be also traumatic, or due to muscular strains, or a kick, or a fall, etc.; it often also appears from a peculiar diathesis

*Translated by R. W. B.

(Raymond, *Recueil de Méd. Vétérinaire*, 1867). We have recorded one case where rupture in aneurism of the aorta was traceably excited through fright in a young remount (R. W. B.).

Pathological Anatomy.—Aneurism of the aorta appears either dilated in the form of a sack, or stretched, or like a hollow cylinder, which is often in contact with the neighbouring organs, such as the liver, intestines, etc. The size of the aneurism may exceed that of a man's head. Schütt observed a case of aneurism where this vessel was so extensively enlarged that it touched the stomach, as well as the small and large intestines. This aneurism may be either in the abdominal portion, the thoracic portion, or at the very origin of the aorta (*Oesterr. Vierteljahresschrift*, 1882, p. 42). Lustig found a very extensive aneurism in a horse, which originated about 6 cm. from the origin of the abdominal aorta, and reached up to the renal artery (*Deutsche Zeitschrift f. Thiermed. u. vergl. Pathologie*, 1876, p. 383; 1878, p. 17). Owing to the formation of the aneurism, the walls of the vessel become atheromatous and undergo fatty degeneration, some portions being calcareous in patches. The structure of the sac is fibrous, and frequently of an exfoliating and crumbling character. Röll has tried cupping and firing in the treatment of these cases with, he thinks, some benefit (*Lehrbuch der Pathologie u. Therapie*, 1885). Owing to the enlargement of the aorta to such an extent as to press on the lungs, stomach, intestines, liver, kidneys, and other organs, it affects these several organs in various ways, and may even burst, discharging its contents into the thorax and abdomen, several instances of which have been mentioned by Labat and Cadeac (*Revue Vétérinaire*, 1884, p. 105) and Vogel (*Repertorium der Thierheilkunde*, 1863, p. 116).

Symptoms.—In most cases aneurism of the aorta is not even suspected, but suddenly, owing to rupture, the animal dies from hæmorrhage. It has been most frequently mistaken for colic in practice. Death from internal hæmorrhage is preceded by acute convulsions. Collapse most frequently results, and the horse drops suddenly to the ground and expires almost immediately. Lustig describes the symptoms thus: The horse struggles violently, then shakes the hinder parts of the body, and all of a sudden falls to the ground, and suffers from extreme dyspnœa and epileptiform convulsions, the head being bent towards the back and the legs stretched out. It is hardly possible to devise any plans of treatment, since the animals generally collapse all of a sudden, without showing any previous symptoms. In aggravated cases there will be present symptoms diagnostic of circulatory derangement, and special symptoms when the aneurism presses upon particular parts and organs.

Treatment.—Injections of ergotine and sugar of lead have been practised, and also galvano-cautery.—*Lerhbuch der Specillen Pathologie und Therapie der Hausthiere,* by Friedberger *u.* Fröhner, Bd. i., 1886.

REPORT ON AN OUTBREAK OF "ANTHRAX" AT MHOW, CENTRAL INDIA, AMONG THE HORSES OF THE CARABINEERS.

BY J. A. MEREDITH, A.V.D., MHOW, CENTRAL INDIA.

(*Continued from page* 81.)

Preparation of food.—After my taking over veterinary charge of the regiment, I consulted the officer commanding the regiment with a view of improving the condition of the horses, and he most readily fell in with my views. The horses had previously been fed upon gram entirely uncrushed, but soaked for a few hours before feeding. This was altered, and the officer commanding bought a gram-grinding machine for each troop, so we had the grain well crushed, in fact much better than it possibly could be done by the ordinary hand-stones. Thus crushed, it was given mixed with one pound of bran *unsoaked* and only previously damped to prevent the bran flying about. Dry grass or hay and the green grass or hariala was given in the usual manner.

Water supply.—The water supply of Mhow is all obtained at present from wells which are distributed all over the station. On the whole, the water-supply is deficient in quantity but fair in quality. When the Government Analyser examined the wells in 1878, some were declared worse than others, but in none was any trace of sewage discovered. A water scheme was brought forward in 1875 to construct a tank among the hills about four miles away, and to bring the water in covered pipes into the station. Some years the heavy battery has been obliged to go out into camp in the hot weather on account of the scarcity of water; but this will now be avoided, as the proposed water scheme is almost complete, and is now supplied to the horse artillery lines and other places in the station. The wells used for the supply of water to the European cavalry lines contain a sufficient, though not an unfailing, supply. The water appears to be good, and I enclose an analysis of each. One-half the regiment was watered at well No. 7, and the other half at well No. 9. F Troop watering at well No. 7, together with E, G, K Troops; whilst B Troop watered at well No. 9, with A, C, and D Troops. Reasoning from this fact I cannot attribute the cause of the outbreak to this source or any contamination in the water-supply.

Lime recommendation.—Lime had been recommended for use in the stables previous to the outbreak, but it was not sanctioned on account of additional expense.

Amount of work horses have been performing of late.—The amount of work the horses have been performing of late has been quite up to the average, including the usual squadron trainings and other hot season exercises; but taking them generally, a vast improvement was to be observed since the camp of exercise at Rupaheli, during which the horses must have lost condition; none of the horses were in any way gross.

History of present outbreak.—The present outbreak made its appearance on August 16th, about 7 a.m., and came under my notice in this manner:—About 7.30 a.m., on the 16th August, I was attending to a sick bullock belonging to the 4-1st (Heavy), Welsh Division, Royal Artillery, when a note arrived from the Farrier Quartermaster-Sergeant, the Carabineers, stating that nine horses of B Troop were admitted into hospital suffering from Fever. I at once proceeded to the chief station veterinary hospital, and upon arrival found the above-mentioned cases and a few others reported sick waiting outside for examination. I examined the admitted horses, and found, as will be seen from reference to each individual case, that they all presented a feverish appearance, one horse especially, whose temperature was over 107°F.; the others varied between this and 103°F. I endeavoured to make as many enquiries as time, etc., would permit, and at first I thought it might be ordinary fever, seeing they were *all grey* horses, and knowing well that the syces will wash (although strictly forbidden to do so) animals of this colour, as it saves a certain amount of labour; but my idea was soon dispersed, as the troop sergeant-major informed me that none of the horses had been washed that day or the previous one. During the time I was making a minute examination of the horses, one suddenly became worse, perspiration flowing down his legs, and his breathing being very distressed. I administered some medicine to all admitted, but before the day was out I had lost two of the best horses within 15 minutes of each other, and two more later on in the evening. Upon *post-mortem* examination of the first two, Anthrax Fever was observed to be the cause of death. My opinion previous to this was to the effect that Anthrax was the cause of this sudden epidemic, but careful not to make an error, I determined to rely upon *post-mortem* examination.

I immediately reported the outbreak to the adjutant, who, in due course, reported the outbreak to the General officer commanding. I also reported the outbreak by wire to the Inspecting Veterinary

Surgeon, Bombay. On the night of the 16th instant I had established my field hospital upon the left hand side of the race-course, that is looking from the lines and veterinary hospital, and about half-mile from the latter place.

Previous to this I made a thorough examination of the remaining horses in B Troop, carefully putting aside any suspicious case and admitting it into the Anthrax Hospital, but some distance away from the horses with pronounced symptoms. The remaining horses were placed on the left of the new hospital with the suspected cases further down the line on the right, whilst the acute cases occupied the extreme right. Care was taken that the wind was always blowing from the direction of the healthy subjects, and fortunately it did not vary more than a few points at any time. So no inconvenience was caused by the wind turning.

I attach clinical observations of the whole of B and F Troops taken from the date of the outbreak until a day when I considered it unnecessary to take further observations; from this will be seen the general increased temperatures of all the horses.

The disease continued with remarkable rapidity, so much so that all the veterinary establishment was more than fully occupied day and night.

Number of cases admitted.. — Upon Thursday, August 16th, nineteen cases were admitted into the field hospital. The following were their respective numbers:—B Troop, 22, 29, 11, 59, 33, 5, 16, 49, 21, 25, 4, 23, 14, 63, 41, 1, 2, 65, and 6; of this number the following died, as will be seen from the record of treatment:—B, 63, 1, 59, and 22. On the following day, the 17th August, Troop Horses B 12, 17, and F 12 were admitted with Anthrax. Upon the latter horse presenting symptoms of Anthrax, I immediately suggested to the officer commanding that F Troop should also be removed to the field hospital; this being sanctioned, I arranged it on the right of the sick horses that were in the veterinary hospital at the time of admission of the Anthrax cases.

I have endeavoured to explain the positions of each more fully on a map, upon which I have marked the various divisions of horses, which were as follows:—B Troop not admitted cases on the left; next to these, with a distance of 400 yards apart, came the less pronounced cases, whilst the more serious cases were picketed between the latter horses and the fire (temporary cinerator). The last-mentioned were removed nearer still to the fire in the event of their cases becoming hopeless. After this I had arranged the real sick horses with the less severe cases on their right, both being well away from the Anthrax cases,

and the extreme right was brought up by F Troop; the whole line extended over a mile, and a half-mile broad.

On the 17th August two more cases proved fatal, horses B 29 and 21. On the 18th instant the following horses were admitted:—B 18 and F 32; and the following horses died upon this day:—B 11 and 33. August 19th, only B 61 and F 14 were admitted, but B 23 and F 14, 41, and 65 died during the night or early morning of the 19th. Some of these cases would undoubtedly have recovered had we not been so terribly unfortunate as to encounter a 48 hours' continuous rainfall, during which the hospital became a mud pond, and the horses were standing over their fetlocks in mud, the blankets were saturated with the rain, and we were quite unable to keep them dry; this, coupled with the inability to keep the horses in their standings from the head and heel pegs continually flying as the horse made any slight movement; this was, of course, most noticeable in the restive cases. These were unfortunately not all the difficulties we had to contend with; for, do what you would, the syces could not be induced to perform their duties well, being more or less cold and miserable with the rain; in fact, they looked as pitiful almost as the horses. This rainfall, although not a heavy one, but continuous, played a most prominent part in so many cases proving fatal during this period.

On the 20th August, B 5, 16, 12, and 14 and F 32 died in the hospital. On the afternoon of this day the Inspecting Veterinary Surgeon, Bombay, arrived in Mhow on duty, and remained until the 25th instant, during which time the following horses died:—August 22nd, B 2 and F 14. Assisted by me, the Inspecting Veterinary Surgeon, Bombay, made a *post-mortem* examination on both of these horses, in which remarkable appearances presented themselves, and I enclose a very rough sketch of each. Upon the 26th instant, the day after the departure of the Inspecting Veterinary Surgeon, Bombay, Troop Horse B 56 was admitted with acute symptoms of Anthrax; the record and treatment of same is herewith sent, and I shall have occasion to refer more in detail to each case as I take them individually. Troop Horse F 30 was admitted on the 29th, and died upon the 30th instant. I shall have occasion to enter fully into this case, as upon it lies the basis of my report and opinion of the outbreak; so I have thought fit to arrange it in my column of remarks. The following is a short record of each case as admitted into hospital, with as full a description of each as time would permit me to note. I regret that, in consequence of my attention being required all day attending to the very sick patients, I was unable to do full justice and gather as many minute symptoms of each case as were presented.

I take the following cases from the Record of Treatment Book, as they were entered during the height of the outbreak.

Case I.

Subject.—Persian entire, grey, aged seven years. Case 539, B 22, 16th August, 1888—Anthrax. Admitted at 7.30 a.m., temperature 107, pulse 44, respiration 26, mucous membranes yellowish red in colour, exhibits pains of a colic nature, moving head and neck up and down, stamping both fore and hind feet as if trying to kick his abdomen; nostrils dilated; lower lip pendulous; eyes staring and glassy, and in appearance looked swollen. In an hour's time the patient became much worse; perspiration flowed down his legs, blowing hard, pulse weaker and more frequent. Upon admission I administered aperient pill, Aloes Barb. 5 drs., Pulv. Zinzib. 1 dr., and followed by repeated doses of stimulants and Acid Carbolic; but the patient gradually became worse and more restive, hanging his head and resting it upon the loose box walls. Spasms of the head and neck of a tetanic nature followed. He fell suddenly, and after great struggling died about 5.30 p.m. Discharged died.

Post-mortem.—Exterior appearances.—No swelling or tumours visible externally, slight crepitation of the skin. Upon opening the abdominal cavity it contained a small quantity of foul-smelling gas and a great quantity of sero-hæmorrhagic fluid, in which was floating about a number of filaria papillosa (male easily distinguishable by his spiral tail), some on the posterior surface of the liver, also on the borders of the intestines connected with the mesentery. Deep ecchymoses of the visceral and parietal peritoneum. All the glands of the mesentery were infiltrated and enlarged with characteristic exudate; the vessels of the mesentery were most prominent and of a dark colour, showing great extravasation. The large vessels contained blood of a tarry-looking color indisposed to coagulate. *Heart* soft, marked with bluish spots, pericardium showed ecchymoses, pericardial fluid extensive and yellow in colour. *Liver* increased in size, friable, and, upon incision, blood of a tarry colour freely escaped. *Lungs*, great serosity in the chest cavity, pleuræ covered with dark spots. *Spleen* of a characteristic pale blue colour, nodulated, enlarged, and with distended capsule. *Urinary organs*, right kidney enlarged, great serosity round the pelvis of each. No indications were observed in the retropharyngeal or laryngeal regions, it being a case of Intestinal Anthrax. Microscopic examination of the blood after death proved it to be a case of Anthrax.

CASE II.

Subject.—A grey Persian entire, aged seven years. Case 540,B 29, 16th August, 1888—Anthrax. Admitted about 8 a.m. This animal presented similar symptoms to the one just recorded. Pulse 56, respiration 18, temperature 106·3, but pulse quite of a different nature, being full and strong; moving lips and head; drooping ears; extremities cold; appetite slight; breathing shallow and quick; the beats of the heart were most distinct. Gave aperient pill, Aloes Barb. 5 drs., Pulv. Zinzib. 1 dr., followed by two hourly doses of Acid Carbol. 7.30 p.m.—No improvement, patient much the same, temperature 106·2, eating little food. 17th August, 1888, 6 a.m.—Pulse 48, temperature 104. No improvement, grunting and showing pain, moving head and neck up and down, and hanging on the head rope. 12 a.m.—No improvement, Acid Carb. given every three hours. 3 p.m.—Much worse, cannot recover. 4.45 p.m.—Discharged died.

Post-mortem.—Extensive extravasation of blood in the subcutaneous connective tissue, tumefaction of the mesenteric glands, congestion of the lungs and brain. Rigor mortis slight, escape of bloody fluid from all the natural openings, the rectum of a deep red colour and everted. On opening the abdomen it was filled with the characteristic exudate of a dark yellow colour; the intestines were generally red coloured and infiltrated with blood. The *spleen* little above its normal size, but of a livid hue, and slight nodulation was observed on its surface. The blood upon examination revealed the presence of the Bacillus Anthracis.

CASE III.

Subject.—Grey Persian entire, aged eight years. B 11, 16th August, 1888—Anthrax. This horse was admitted at 10 a.m. Pulse 57, temperature 107.1, blowing hard, uneasy, and exhibited a haggard expression; drooping ears; glassy eye; mucous membranes injected and of a yellowish tinge; lower lip hanging, stamping of the feet, general drowsiness and prostration, and appears to be suffering from colic. No external swellings were to be observed. Gave aperient pill, Aloes Barb. 5 drs., Pulv. Zinzib. 1 dr. 10.30 p.m. —Patient no better, gave Sodæ Bicarb. ½oz. in a ball, eating a little during the day. 17th August, 1888, 6 a.m.—Much the same, but showing more pain, keeps lying down and getting up. Gave Acid Carb. 1 dr., together with a stimulant. 6.30 p.m.—Pulse 40, temperature 104; no improvement. Has been raining all day. 18th August, 1888.—Horse much worse; still raining; blankets wet

and cannot dry them, ground fetlock deep in mud. 12 a.m.—Continues to get worse, cannot recover; bowels have not responded to aperient. Patient died at 2.10 p.m. Discharged died.

Post-mortem examination revealed the following:—On opening the abdominal cavity a great quantity of sero-hæmorrhagic fluid was present, the glands of the mesentery were enlarged and infiltrated, and dark coloured markings were observed all over the peritoneum, deep infiltration of the large and small intestines, more so at the point of attachment to the stomach; in the sub-lumbar region tumours of various dimensions were visible, containing a serosity of a yellow colour; the mass of fatty tissue situated around the kidneys was also infiltrated. *Spleen* was the seat of characteristic and most apparent lesions, being greatly increased in size, and weighed 12¾lbs., very much thickened and elongated, of a livid blue colour, with capsule distended and rupture of the same, allowing the thick coloured blood to exude freely. Microscopic examination revealed the presence of the Bacillus Anthracis.

Case IV.

Subject.—A grey Persian gelding, aged seven years. Case 542, B 59, 16th August, 1888—Anthrax. Admitted at 8 a.m. Similar symptoms to the other cases; runs back in the corner of the box; colic pains; general drowsiness, mucous membrane injected; pulse 52, respiration 42, temperature 102·3. Gave Mag. Sulph. 8oz., Spt. Æther Nit. 1oz. 12 a.m.—No better; gave Acid Carb. 1dr. in water. 7.30 p.m.—Patient has gradually become worse, and died after great struggling. Discharged died.

Post-mortem.—Intestinal form.—Abdominal cavity containing a great quantity of dark yellow exudate, the peritoneum and mesenteries covered with ecchymosed spots, the large veins of the intestines were of a bluish appearance, and tumours were present in the sub-lumbar region. Liver enlarged and contained a quantity of tarry-looking fluid, which freely escaped upon making an incision, very friable and easily broken down. The yellow-stained extravasations were observed throughout the body. The pericardium was covered with ecchymosed spots, and the pericardial fluid was extensive; the large vessels of the heart were filled with tarry-looking blood, and the muscular tissue of the heart was covered with dark coloured markings, the base being studded with yellow spots; the chest contained an amount of serosity, and the lungs presented a congested appearance; the kidneys were increased in size and friable, no manifestations were observed externally, and the pharyngeal region was free from infiltrations.

The intestinal lesions were conspicuous in this case. Microscopic examination showed the presence of the Bacillus Anthracis.

CASE V.

Subject.—A grey entire Persian, aged eight years. Case 543, B 33, 16th August, 1888—Anthrax. Admitted at 10 a.m. Pulse 60, temperature 106·2, respiration 42, exhibiting similar symptoms to the other. Gave aperient pill, Aloes Barb. 5 drs., and Pulv. Zinzib. 1 dr., Acid Carb. 1 dr., repeated every three hours. 10.30 a.m.—Appears easy but dull, and refuses all food. 17th August, 1888, 6 a.m.—Patient no better, uneasy, pulse 42, temperature 104·2; Acid. Carb. repeated. 6 p.m.—No improvement, temperature 106, bowels not responded; raining hard, blankets wet, and standings bad. Swellings in the pharyngeal region, also swollen lymphatic glands, grunting; treatment continued. 18th August, 1818, 6 a.m.—Temperature 105, pulse 44, throat more swollen, eating a little. Acid Carb. and Sodæ Bicarb. given; great difficulty in respiration, so much so that I performed tracheotomy. At 11 a.m.—Patient seemed to rally after this, but only to suddenly become worse, and died about 3.30 p.m. Discharged died.

Post-mortem Examination.—External manifestation.—The natural openings everted and the living membrane of the rectum deeply injected; great swelling in the pharyngeal and laryngeal regions. The abdominal cavity contained only a little exudate, but extravasations were observed throughout. The spleen was only a little enlarged, but of the characteristic colour, and slightly nodulated. The peritoneum and mesenteries were deeply stained. Stomach presented the usual anthracoid appearance, and contained little or no food. Liver and kidneys exhibited a congested appearance. On opening the thoracic cavity a great quantity of yellow exudate was observable. Lungs congested and ecchymosed, pleuræ studded with dark markings, great œdema of the glottis, which was deeply infiltrated with serosity, presenting a gangrenous appearance, which extended round the point of operation of tracheotomy. Microscopic examination of the blood exhibited the Bacillus Anthracis.

CASE VI.

Subject.—Iron grey Persian entire, aged six years. Case 544, B 5, 16th August, 1888—Anthrax. Admitted at 7.30 a.m. Dull and depressed look, pulse 62, respiration 32, temperature 105, breath fœtid; lips pendulous; eyes glassy, and presented very many similar symptoms to the others admitted. Treatment con-

sisted in giving an aperient pill and Sodæ Bicarb. with Acid Carb. every three hours. 10.30 p.m.—No better; treatment continued. Temperature 106·1 at 7.30. 17th August, 1888, 6.30 a.m.—Swellings round the throat, discharge of a greenish colour from the near nostril. I extracted blood from subject, and upon placing some under the microscope, spores of the Bacillus Anthracis were distinctly visible. Am of opinion horse will not recover; colic pains increased; pharyngeal region more swollen, only soft to the touch; free yellowish green discharge from both nostrils. Temperature 104·4 at 6 p.m. 18th August, 1888.—Pulse 44, weak, temperature 103·1. At 9 a.m.—Mucous membranes deeply injected; swelling increased; dull, but quiet; discharge from both nostrils continues; treatment has been continued. 6 p.m.—Temperature 106. Swelling of the throat increasing and cannot take any food; tries hard to drink water, and only manages to take a mouthful now and again; hanging his head; does not lie down, and appears worse. Raining hard. 19th August, 1888.—Temperature 102·2. 10.30 a.m.—Horse still standing, but cannot last much longer; nostrils greatly dilated. Gave Ammon. Carb. 2 drs., Hypo. Sulph. Soda 1 dr. 6.30 p.m.—Temperature 104; no improvement; treatment continued. 20th August, 1888.—Horse much worse; died at 4.30 a.m. Discharged died.

Post-mortem Examination.—External appearances.—Great anthracoid swellings in the pharyngeal region, also in front of the chest; discharge of thick yellow-coloured fluid from both nostrils; mucous membranes of a deep salmon colour; crepitation throughout the skin. Upon opening the thoracic cavity a great amount of serosity was to be seen, the pericardium was ecchymosed, and the pericardial fluid extensive. *Heart* not firm to the touch, feeling quite flabby, and dark stainings were present upon the walls of its cavities; the large vessels contained tarry-looking blood, pleuræ ecchymosed, and the lungs presented a congested appearance, nodulated, and stained with dark blood colourings; much effusion was present around the base of the heart and root of the lungs. Deep yellow infiltrations were found along the course of the trachea, which exuded upon incision, the skin around the parts appearing semi-detached. The peritoneal cavity presented a somewhat less virulent appearance, but contained a certain amount of serosity; the peritoneum and mesenteries were infiltrated, and the large blood vessels exhibited a peculiar blue aspect. *Spleen* of its normal size, bluish and nodulated. *Liver* congested and friable; large and small intestines of a deep red colour. *Kidneys* congested and surrounded by a considerable amount of exudation. The lining membrane of the stomach was congested and deeply stained.

CASE VII.

Subject.—A grey Persian entire, aged six years. Case 545. B 16, 16th August, 1888—Anthrax. Admitted at 7.30 a.m. One of the first in B Troop to show symptoms of illness; pulse 66; respiration 34; temperature 107·2; mucous membrane pale yellow; drooping ears and lip; abrasions on gums; breath fœtid; dull, and showing Colic pains. Gave aperient pill. 10.30 a.m.—Horse much the same. Gave Sodæ Bicarb. and Acid Carb. 17th August, 1888.—Pulse 48, temperature 104·4; aperient operated and horse appears somewhat better. Gave Sodæ Bicarb. ½ oz. at 6.30 a.m. 12 a.m.—Looking much sharper; has been eating a little all day. 6 p.m.—Temperature 106. 18th August, 1888, 6 a.m.—Temperature, 105·2; pulse 46; dull; no smellings; eating little; may pull through; treatment continued. 6 p.m.—Temperature 106; still much the same; eating; this horse has been like this since admission, and has not shown an acute period. 19th August, 1888, 10 a.m.—Temperature 104·3. Patient appears much the same. Gave Ammon. Carb. 2 drs., Sodæ Hyposulph. 1 dr. 6 p.m.—Temperature 104·2; horse appears to have had a relapse; treatment continued. 20th August, 1888.—Much worse; cannot recover; died at 9.50 a.m. Discharged died.

Post-mortem.—Intestinal Anthrax—Abdominal cavity contained an enormous quantity of serous exudate in which were floating about a number of filaria papillosa similar to horse B 22. The mucous membrane of the gastro-intestinal tract was softened and of a deep colour, more especially the pyloric portion of the stomach. The mesenteries were covered with ecchymosed spots, the large veins of the intestines being distended, with blood of a dark colour. Charbonous tumours were present in the sub-lumbar region, containing a serosity of a yellow colour; decomposition was most rapid, rectum everted, and peritoneum studded over with dark spots. There was also observed a large charbonous tumour in the scrotum, completely enveloping both testicles. *Spleen* enlarged slightly, of the peculiar blue aspect; nodulated and felt quite flabby upon manipulation; a slight rupture was seen upon its surface. *Liver*, right lobe of a peculiar yellow colour; the remainder of the organ was dark and appeared congested; small abscesses were present upon the surface of the right lobe; upon incision, blood of a dark colour freely escaped. Nothing more than ecchymoses of the pleuræ and the presence of a certain amount of serosity were detected in the thoracic cavity. No external tumours were present. The blood revealed the presence of the Bacillus Anthracis.

Case VIII.

Subject.—A grey Persian gelding, aged eleven years. Case 546, B 49, 16th August, 1888—Anthrax. Admitted at 10.30 a.m. Off feed; dull and uneasy; extremities cold, and appears similar to others admitted; pulse 41; respiration 38; temperature 102·3. Gave aperient pill and followed by Sodæ Bicarb. ½ oz. 10.30 p.m.—Much the same, Sodæ. Bicarb. continued. 17th August, 1888.—Looking a little better, but still refuses food; bowels responded to aperient; removed him to top of hill, a little distance from the others, at 12 a.m. 6 p.m.—Much the same; temperature 103. 18th August, 1888.—Temperature 106·3; pulse 41 at 6 a.m. 5 p.m.—Temperature 101·2; eating a little; treatment continued. 19th August, 1888, 10 a.m.—Temperature 99·4; appears better; no relapse has yet taken place. Gave Ammon. Carb. 2 drs., Sodæ Hyposulph. 1 dr., repeated at 1 p.m. At 6 p.m.—Temperature 101·3; appears much the same; treatment continued. 20th August, 1888.—Temperature 101·3; pulse 36; much the same. 6 p.m.—Temperature 101·3; doing well. 21st August, 1888.—Temperature 101·3 in the morning; 6 p.m.—Temperature 101·1. 22nd August, 1888.—Temperature 99; pulse 46; 4 p.m.—Temperature 101·1; eating lucerne; doing well. 23rd August, 1888, 9 a.m.—Temperature 100; 6 p.m.—Temperature 101·1; pulse 42; treatment discontinued. 24th August, 1888, 9 a.m.—Temperature 98·1; 6 p.m.—Temperature 101·2. 25th August, 1888.—Temperature 99·2; 5.30 p.m.—Temperature 101. 26th August, 1888, 7.30 a.m.—Temperature 99·3; 6 p.m.—Temperature 100; doing well; eating regular feed. 27th August, 1888.—Doing well; no further treatment necessary. 7th September, 1888. Discharged cured.

Case IX.

Subject.—A grey Persian entire, aged six years. Case 547, B 21, 16th August, 1888—Anthrax. Admitted at 2.30 p.m. Patient was taken out of lines looking dull and showing Colic pains; temperature 106, pulse 56, respirations 50; perspiration profuse. Gave aperient pill, Sodæ Bicarb. and Acid Carb. 4 p.m.—Horse much worse. 10 p.m.—Laboured breathing; temperature decreasing; will die; greatly distressed appearance. 17th August, 1888.—Horse died at 7.30 a.m. Discharged died.

Post-mortem.—*Intestinal Anthrax.*—Great swelling of the abdomen from accumulation of gas in the gastro-intestinal canal; rectum everted and blood escaping from the same; mucous membranes of the mouth and nose covered with ecchymoses. Upon

incising the abdominal cavity a great accumulation of the peculiar serosity was observed; the peritoneum presented a spotted appearance; extravasations of the small and large intestines; the mucous membrane of the gastro-intestinal canal was thickened, soft, congested, and easily broken down; in some portions great sears were to be seen; decomposition was rapid. The mesenteric glands swollen and infiltrated with the characteristic exudate. *Liver* presented a congested appearance, and upon incision blood ran out of the nature of tar; the large abdominal vessels were also full of blood of a similar nature. *Spleen* not much enlarged, weighing only 2½ lbs., but presented a nodular bluish appearance. *Kidneys* much congested and contained a quantity of serosity in the pelvic cavities. *Bladder* congested and contained urine of a treacly consistency. Nothing very characteristic was noticed in the chest or pharyngeal regions, except a general yellow staining around the various lymphatic glands. The direct seat of the disease seemed to be confined to the abdominal cavity.

Case X.

Subject.—A grey Persian gelding, aged six years. Case 548, B 25, 16th August, 1888—Anthrax. This horse was admitted at 4 p.m.; off feeding; blowing; general drowsiness and dull looking; eyes staring; ears drooping, and twitching of the lower lip, and many other symptoms similar to the others, but perhaps not so severe; temperature 104·2, pulse 51, respirations 34. Gave aperient pill, Sodæ Bicarb. Tinct. Aconite. 10 p.m.—Temperature 104. 17th August, 1888, 6.30 a.m.—Temperature 103·2; looks lively and sharper; pulse 42; had been removed a little distance from the others. 6 p.m.—Much the same; temperature 103·4; medicine repeated, Sodæ Bicarb. ½oz. Tinct. Aconite 20 min. 18th August, 1888.—Temperature 102·1, pulse 39; doing well; eating all food; bowels responded to aperient. 6 p.m.—Temperature 101·3; appears no worse. Gave Sodæ Hyposulph. 19th August, 1888, 10 a.m.—Temperature 99·3; improvement, and should make a recovery. 6 p.m.—Temperature 102; patient appears to have a relapse; treatment continued. 20th August, 1888.—Temperature 102·1, pulse 44; much the same. 6 p.m.—Temperature 102·1; treatment continued. 21st August, 1888.—Temperature 99·3; some improvement. 6 p.m.—Temperature 100, pulse 40; doing well. 22nd August, 1888, 6 a.m.—Temperature 98, pulse 42. 4 p.m.—Temperature 100·3; treatment continued. 23rd August, 1888.—Temperature 100; eating lucerne and half diet food; doing well. 6 p.m.—Temperature 100, pulse 40. 24th August, 1888.—Temperature 99·1.

6 p.m.—Temperature 100·2, Sodæ Bicarb. ½dr. 25th August, 1888, 6 p.m.—Temperature 98·3, Sodæ Bicarb. ½oz. 5.30 p.m.—Temperature 100·2. 26th August, 1888.—Temperature 100·1, pulse 40. 7.30 p.m.—Temperature 100·1, pulse 38; doing well. 27th August, 1888.—Improvement; no further treatment necessary. 3rd September, 1888.—Doing well. 7th September, 1888. Discharged cured.

Case XI.

Subject.—Grey Persian entire, aged six years. Case 549, B 4, 16th August, 1888.—Anthrax. Admitted at 7.30 a.m. Temperature 105·2, respirations 48, pulse 44; mucous membranes yellow; off feed; dull and uneasy, but hardly exhibiting such acute pains as some others admitted. Lips, ears, and eyes of the characteristic nature; nostrils dilated; extremities cold. Aperient pill was given followed by Sodæ. Bicarb. every three hours. 10 p.m.—Much the same; medicine repeated. 17th August, 1888, 6 a.m.—Pulse 36, temperature 104. Gave Acid Carb. alone. 12 a.m.—Looking brighter, Sodæ Bicarb. 6 p.m.—Temperature 103·4. 18th August, 1888.—Temperature 102·4, pulse 39; throat somewhat swollen; no discharge; bowels responding freely to aperient; treatment continued with Hyposulph. Sodæ. 6 p.m.—Temperature 102·1; does not appear any worse; treatment continued; eating a little. 19th August, 1888.—Temperature at 10 a.m. 103·3; increased, but horse does not show any other signs of becoming worse. Gave Ammon. Carb. 2 drs., Sodæ. Hyposulph. 1 dr., and repeated. At 6 p.m.—Temperature 101·4. 20th August, 1888.—Temperature 101·4, pulse 34; much the same. 6 p.m.—Temperature 101·4; improvement; eating. 21st August, 1888.—Temperature 100; continues to improve; throat still swollen. 6 p.m.—Temperature 101·2, pulse 40; doing well; slight discharge from near nostril. 22nd August, 1888, 6 a.m.—Temperature 100, pulse 36. 6 p.m.—Temperature 101, pulse 40; eating. 23rd August, 1888.—Temperature 100·3, pulse 42; appears to be doing well; eating half diet and lucerne; should make a recovery. 6 p.m.—Temperature 100·2. 24th August, 1888.—Temperature 97·4. 6 p.m.—Temperature 101·2, Sodæ Bicarb. 25th August, 1888.—Temperature 100·2. 5.30 p.m.—Temperature 100·2. 26th August, 1888, 7.30 a.m.—Temperature 100·4; evening temperature 100; doing well. 27th August, 1888.—Improvement; no further treatment necessary. 9th September, 1888.—Discharged cured.

(*To be continued.*)

Editorial.

MEAT INSPECTION.

THE subject of meat inspection has been very much neglected in this country, but there is evidence that it is at length attracting attention, and that circumstances will tend before long to bring it very prominently under notice. It is regrettable, but not very remarkable, that little, if anything, has been done in this direction to safeguard the health and interests of the public. The killing of animals and dressing of their flesh for human consumption, in private slaughter-houses, has long been a grave scandal, while the fact that there was absolutely no guarantee that the animals were healthy was always a source of serious apprehension to the sanitarian. There are diseases, parasitic and others, which, under certain conditions, render the flesh of creatures affected with them very dangerous to those who consume it. This is more apparent to the veterinary surgeon, perhaps, than to any other member of the community, and though for years he has been doing his utmost to call attention to the matter, it is only lately that its seriousness has been perceived, and the question of adequate protective measures has begun to be discussed.

The necessity for public abattoirs in every town, or, at least, rigid slaughter-house inspection, has long been insisted upon. Not only should these places be kept in a proper condition, but the health of the animals killed in them, and the fitness of their flesh for food, should be carefully noted.

On the Continent public abattoirs are the rule, and the way in which they are conducted is a guarantee of safety to the people, as well as a valuable source of information with regard to the prevalence of disease among the animals killed in them. It is needless to add that everything relating to these abattoirs, as well as the inspection of meat, is in the hands of officially appointed and thoroughly competent veterinary surgeons, who alone are considered fit for this duty. That such should be the case in this country there can be no doubt whatever, though if we may judge from the opinion expressed in the *British Medical Journal* of July 27th, the members of our profession in these islands are not yet in a position to undertake the functions so well discharged by their colleagues elsewhere. "Individual members of the veterinary profession," our contemporary admits, for a wonder, "have made most valuable contributions to the literature of Tuberculosis, but as was only too apparent from the nature of the evidence tendered at the trial at Glasgow, especially that on behalf of the defence, the veterinary surgeon is not as a rule the man best qualified to judge as to the fitness of carcases for human food."

We have only to refer to the report of the Glasgow trial to discover that some of the medical witnesses were far less trustworthy, and gave far more absurd opinions with regard to Tuberculosis, than did one or two of the veterinary witnesses. Our generous contemporary

goes on, "Enormous strides have been made in recent years by the veterinary schools, not only in the completeness of their course and the thoroughness of their teaching, but in the character of the qualifying examination, and it is not going too far to say that the next generation of veterinary surgeons will be fully competent to undertake the duties assigned to them in the above recommendation; but for the present it is to be feared that, with few brilliant and outstanding exceptions, they do not possess the necessary qualifications. We are sorry to write this, for we do not think that such work falls within the province of medical officers of health. Their duties and responsibilities are already sufficiently onerous, but, except in large teaching centres, they are the only men who are at all able to give a reliable opinion."

We venture to express the opinion that the *British Medical Journal* knows little of, or ignores the competency of veterinary surgeons for such work; at least, for many years we have remarked the indifference or neglect with which it has treated veterinary subjects, and, as in the present instance, its tendency to sneer at or depreciate the work done by our colleagues. This we can well afford to overlook when it only affects us as a body; but when it imperils the public health and wealth we should consider ourselves blameworthy if we did not protest against the *dictum* pronounced by the journal in question, and maintain that veterinary surgeons only are capable, by their training and experience, to be inspectors of the flesh of animals intended for food. This fact has been fully recognised and acted upon in countries in which human medicine occupies as high a position as in the United Kingdom, and our members are assuredly as well fitted now for discharging such a responsible duty as their Continental colleagues. We trust they may soon have an opportunity of proving how much the *British Medical Journal* has disparaged them.

EPIZOÖTY OF HERPES EPILANS.*

BY MM. DELAMOTTE AND BOGENEZ.

THIS epizooty was observed among the horses of a regiment of Dragoons at Montauban. It began after the arrival of remounts, spread rapidly, and lasted five and a half months, during which 280 animals were attacked. The disease usually began with a papulous eruption on the rump, over the loins, the back, and the sides of the neck and shoulders. The papules, as large as a half-franc piece, were hard, convex, and slightly conical. Some of them were as large as a two-franc piece, but flat, not convex. Their evolution lasted from one to six days. The hair stood erect and finally fell off. After the disappearance of the papules, only a yellowish scab remained, which soon fell off, leaving a bare and slightly irregular surface, which was humid and always without hair. In the worst cases, the scabs were large and thick, covering ulcerated and moist patches. When the horses were otherwise in good condition, the disease cured itself almost spontaneously in fifteen days; but on certain more or less weak subjects it tended to spread and last. The treatment employed for these last was, shaving the diseased parts,

* Translated by R. W. B.

rubbing off the scabs, and touching the herpetic patches with a solution of sulphuric acid. Usually, judicious measures of disinfection sufficed to prevent the spread of the disease.

This disease is produced by the *tricophyton epilans*, a fungus of the same order as the *tricophyton tonsurans*, and its active propagation explains the contagiousness and tenacity of the disease which it gives rise to. In the first disease the layers are numerous, irregular in shape, slightly humid, and always without hair. In the second, the scabs are quite circular, never numerous, always dry, and covered with short, stumpy hair.—*Recueil de Med. Veterinaire.*

Antirabic Properties of Sol. Pilocarpine.

BY M. NOCARD, DIRECTOR OF THE ALFORT VETERINARY SCHOOL.

Professor Mocard, Director of the Alfort Veterinary School, recommends subcutaneous injections of pilocarpine in Rabies. He has used it in doses of 1 to 4 centigrammes, injected under the skin of the tail, in the dog. He has had recourse to this treatment in the horse with the same success. M. Nocard injects, in solipeds, in doses of 12 to 16 centigrammes in each injection.—*Recueil de Med. Veterinaire.*

Treatment of Tetanus by Intra-Muscular Injections of Chlorhydrate of Cocaine.

BY A. VILLA, OF CREMA.

The patient under observation, a colt a year and a half old, exposed to intense cold ten days after castration, was attacked with very severe Tetanus. Encouraged by my successful use of cocaine in the reduction of inguinal hernia, I wished to use it in the reduction of trismus, the most severe symptom of Tetanus. I injected into each masseter, in different places, two injections of chlorhydrate of cocaine. During the evening of the same day I repeated the same operation (chlorhydrate of cocaine, 1·20 gramme in 8 grammes of distilled water; 1 gramme = 15½ grains, Eng.). And also as an adjuvant I gave a subcutaneous injection of ½ gramme of the acetate of morphia. Next morning the muscular rigidity had much diminished, and the animal had taken some food. Encouraged by this first success, the author gave two more injections in four places, along the sterno-maxillaris, with a solution of two grammes of cocaine. The operation was repeated three times at intervals of twelve hours. Two days after, the tension of the neck had diminished and permitted lateral movements of the head. I then ceased to use cocaine, and substituted curare and pilocarpine in hypodermic injections, and chloral by the mouth and by means of clysters. A complete cure was obtained.—*Recueil de Med. Veterinaire.*

Treatment of Traumatic Erysipelas by Resorcine.

BY R. KUFFNER, OF MONACO.

Resorcine can be employed in Erysipelas in three different forms: in subcutaneous injections; as a lotion (*lavages*); and as an ointment (pommades). This last method, tried by Andeer, Cattani, Moncorvo, Unna, and many others, is preferable to using watery solutions, which produce an astringent effect on the tissues and render absorption difficult. As to subcutaneous inoculations, they give uncertain results, and if used strong, leave disagreeable scars. A mare seven years old presented very evident Erysipelas at the back of the left foot, following a kick. At different points excavations had been produced, some covered with scabs, others moist and suppurative. The animal avoided putting its foot to the ground. The skin appeared tight and inflamed, and was painful. The excoriated parts were washed, and

resorcine ointment was applied to the diseased parts. Next morning there was no noticeable improvement; the application was repeated. On the fourth day there was a sensible improvement, and the scabs at the excoriated points had fallen off. On the fifth and seventh days, friction was employed and a bandage put on. The cure was effected in thirty-five days. There were two other similar cases.—*Recueil de Med. Veterinaire.*

PRELIMINARY REPORT OF THE BOARD APPOINTED TO MAKE FULL INQUIRY INTO THE ORIGIN AND NATURE OF A PREVALENT DISEASE AFFECTING STOCK, COMMONLY KNOWN AS "MANGE," IN QUEENSLAND.

To the Honourable the Colonial Secretary.

SIR,—In accordance with the instructions issued to us on the 14th March, we have the honour to submit the following Preliminary Report, premising that we are moved in doing so thus early in the progress of our investigations—firstly, by reason of the consideration that certain important facts bearing on the nature of the disease in question are already at our disposal to communicate; and secondly, since publicity has been given to what we feel bound to regard as exaggerated statements relating to its general character, which, unqualified, are calculated to detract from that reputation which the stock of the colony has already gained in other parts of the Australian continent. Immediately after receiving your instructions it was decided that an early opportunity should be taken of inspecting some of the affected stock of the West Moreton District, and it having been brought to our knowledge that typical illustrations of the disease existed in plenty in the vicinity of Harrisville, that township was in the first instance visited. Arriving there, then, on the 14th March, operations were commenced early on the following day with the close examination of a number of affected horses, made in order to gain acquaintance with the general character of the disease, to detect if present the existence of a minute insect previously reported as constituting one of its exciting causes, and to notice the effect if any of certain agents which had been employed with a view to its eradication. On the 14th March, also, a journey was made to Obum Obum for the purpose of seeing a small flock of sheep in which the existence of a disease supposed to be identical with the one affecting horses had been previously brought to light. Whilst proceeding thither, too, some cattle evincing symptoms of an affection of the same nature also came under observation. The sheep at Obum Obum were reported to have formed a portion of a flock which had travelled from Cambridge Downs, in the Flinders District. They had been shorn after 1st January, 1888, and the disease was first observed in them by their present owner on the 11th February. When seen by the Chief Inspector of Stock on 15th February, about 30 per cent. were more or less affected—the majority, however, very slightly so. On the day on which they were examined by us the percentage of affected individuals had considerably increased. Grazing with these sheep were several hundreds that had been shorn in August, 1887, and consequently carried at the time of our visit a fleece of seven months growth. None of the latter appeared to have shown symptoms of the disease It was also brought prominently to our notice that all the sheep that were affected were such as had very open fleeces; whilst those in which the wool was more dense and that had developed a considerable supply of yolk were free from any outward signs of the disease. In order to determine whether the condition of the animal, as displayed by *post-mortem* examination, would throw any light upon the origin of this disease, an autopsy of a sheep on

which it had manifested itself to an average extent was made by Mr. James Irving, and although a very searching inquiry was conducted, everything observed pointed to the conclusion that the animal was perfectly healthy.*

Here Mr. Tryon obtained material for future investigation into the nature of the disease as it affected sheep.

Both at Obum Obum, as also at Harrisville, the condition of the pasture engaged the attention of Mr. F. M. Bailey, and from his observations he was led to regard the indigenous grasses and other fodder plants in both these localities as being not only abundant, strong, and healthy, but also exceptionally free from fungus blight. He, however, remarked that the fungus—*Sphærella destructiva*, B. and Br.—was very thick on lucerne supplied to horses in the Harrisville District. It could not, however, be inferred that this fungus exerted any toxic influence on the stock which thus consumed it.

Messrs. Irving, Gordon, and Tryon having returned to Harrisville, they there held an informal conference, at which a form of circular drawn up with a view to elicit information on the subject of the disease from residents in different parts of the colony was adopted.

This circular we have the honour to submit as an Appendix to this Report.

The Board, with the exception of Mr. Tryon, who remained in the Harrisville District until 21st March, returned to Brisbane on the 16th day of that month.

Mr. Tryon on that day visited both horses and cattle subject to the disease in the Rosevale and Mount Walker Districts, and also commenced a series of investigations into its nature and origin, having meanwhile procured examples of living tissue from different classes of stock affected by it.

The results arrived at by Mr. Tyron thus early in the prosecution of his work are recorded in the accompanying Special Report. These conclusions briefly summarised are as follows:—

1. The disease in horses, cattle, and sheep is one and the same.

2. It is confined to the cuticle, or scarf skin, and the hair, and does not extend into the cutis or true skin itself, although it occurs in the roots of hairs which penetrate it.

3. Other deeper lesions, very generally met with, are secondary occurrences only, and not necessarily connected with the presence of the disease.

4. Its occurrence is invariably associated with the presence of a minute fungus, allied to *Trichophyton tonsurans*, which exists especially in the "stroma" state. This is met with in immense numbers in every part implicated in the disease, and may be cultivated separately from it.

5. This minute fungus is the cause of the affection, which, therefore, must be regarded as a vegetable parasitic disease.

6. The disease being of this nature is theoretically contagious, although natural checks may ordinarily occur to mitigate the full influence of its contagious nature.

7. The principle of contagion, viz., the minute sporule of the fungus, is constantly disseminated by the diseased animal itself.

8. This disease exists in this Colony in an epidemic form.

9. It is neither a novel skin disease, being one which has occurred amongst stock in different parts of the world, nor is it of the nature of Mange. The term "Queensland Mange" is, therefore, altogether inappropriate.

10. Its presence in no wise affects the wholesomeness of the flesh of animals, which are otherwise suitable for the butchers' requirements, nor does it necessarily lessen the value of their hides.

* As far as at present known, this instance of the disease affecting sheep is a solitary one.

11. The peculiar form which the disease takes in sheep is due to the anatomical relation between the wool and the skin being different from what subsists between the latter and the hair in other classes of stock.

12. Though in sheep the wool and cuticle are shed as a result of the presence of the disease, the skin is not permanently injured, it having already developed a new cuticle and rudimentary wool fibres.

13. The treatment indicated is that available in cases of skin diseases due to the presence of related vegetable parasites.

14. Over-treatment, and especially the use of materials not indicated by the nature of the disease as giving rise to secondary pathological conditions, are especially to be deprecated.

We concur in these deductions based on Mr. Tryon's investigations, which are still in progress. Meanwhile, amongst other inquiries connected with our commission, we are directing our attention to the discovery of a remedy with which most expeditiously to combat the disease.

As far as can be at present ascertained the geographical range of the occurrence of the disease, as deduced from reports which have been made to the Chief Inspector of Stock, are as follows:—Along the coast watershed from south of the Tweed River in New South Wales to the York Peninsula; in the country having a watershed to the Gulf of Carpentaria; on the Barcoo; the Thomson Rivers; Birdsville on the Western border of the Colony, and on the southern border westward as far as the Maranoa.

At present we do not feel justified in urging the adoption or creation of any legislative measures with a view to check the further incursion of the disease, seeing that it is already so widely distributed in the Colony.

We have, etc.,

JAMES IRVING, M.R.C.V.S.L.
HENRY TRYON,
Assistant Curator, Queensland Museum.
F. M. BAILEY, Colonial Botanist.
P. R. GORDON, Chief Inspector of Stock.

Brisbane, 24*th March*, 1888.

SPECIAL INTERIM REPORT ON THE ORIGIN AND NATURE OF A DISEASE AT PRESENT EXISTING AMONGST THE STOCK OF THE COLONY AND COMMONLY KNOWN AS "MANGE."

BY HENRY TRYON, ASSISTANT CURATOR, QUEENSLAND MUSEUM.

Horse.

Seat of the Disease.—In a typical example of an affected horse the disease occupies the following situations, being more or less continuously distributed over the parts mentioned—from the forehead right along the top of the neck and centre of the back to the root of the tail, and thence along the external aspect of that organ, occurring with greatest virulence on the forehead, wither, croup, and at the root of the tail. Laterally it reaches downwards to a considerable extent, especially on the wither, shoulder, and ribs. Thus it sometimes occurs half-way down the sides of the neck nearly to the knee (elbow) joint, or to the point reached by the saddle flap. The ears, too, are often completely occupied externally by the disease. It occurs not only on parts covered by a temporary growth of hair annually shed and renewed again, but in others where, as in the case of that of the mane and of the tail, the hair having persistent bulbs is of perennial growth. The extent of surface involved by the disease depends on the time which has elapsed since its onset, and during its progression patches increase in size by peripheral encroachment on previously sound places, with or without coalescence with other patches of

affected surface, accordingly as these are present or otherwise. Thus the outline defining the limit of the disease is a very irregular one.

Onset.—The first indication of the presence of the disease is found in the occurrence of slight swellings of low elevation, similar in appearance to the weal occasioned by the attacks of certain insects. These obviously can only be remarked in situations where the hair is short, and so escape notice when they arise on parts occupied by the mane, etc. If the surface of the cuticle is exposed at these spots, and the small weals be squeezed with some force, a minute drop of serous fluid generally arises at a single point, and thus indicates an initial lesion of very circumscribed area, a concentrated presence of an irritant at one spot. Later on this liquid exudes of its own accord, and, together with the cuticle cells immediately adjacent, which exfoliate, forms a tiny scab scarcely larger than the head of an ordinary pin, and this may persist for some days. Around the centres which thus arise, small spots, of the size of a pea to that of a sixpence, on which the hair is more or less completely shed, gradually develop. These spots may in some cases, and especially when they occur on the sides of the neck, remain isolate for some considerable time, but generally they coalesce to form patches. On the skin from which the mane arises, the inflammatory product early produced, elsewhere to so limited extent, not being able to exude upwards, and so escape, may increase in quantity, and thus occasion at this spot a kind of pustular eruption.

General Characters.—The parts affected by the fully developed disease present the following characteristic appearances:—Where the hair is naturally short the general surface has a greyish colour, this hue being due to the presence on such hair as is still remaining of a very fine dust-like substance, consisting of minute fragments of cuticle or scarf skin. The greater part of the hair itself is shed, and that which remains is much altered in condition. Instead of sloping downwards from its origin it now stands almost erect; it is also variously bent or twisted—the free extremities pointing in various directions. When plucked out the individual hairs will be found to have broken off short, or if the hair-bulbs still persist these will be found to have swollen and lost their usual symmetry of form, or to be small and rough. Moreover, a certain degree of constriction at the union of the hair-bulb and shaft generally accompanies the other changed conditions. The hair also is shorter and stouter than is normally the case, and may be of a somewhat lighter shade of colour. These appearances of the hair-bulb are exaggerated in the case of the mane and tail. Within the boundary of the area occupied by the disease, islands may occur of still unaltered hair, which have been included by the spread of the affection, but the limits of these are ill-defined, and as the malady invades them they also gradually lose their distinctive characters.

The mane puts on a very distinctive character—a great part of its component hair, as likewise also is much of the hair of the affected part of the tail, is shed. What remains breaks off at different lengths, so that a very peculiar hog-mane of irregular jagged outline is produced—a feature more pronounced in the hinder portion as the wither is approached. The hair at the root of the tail also, where not shed, is broken off shortly, and stands out in a quaint manner.

Everywhere at the roots of the hairs much scurfiness is produced. The free particles of scarf-skin form the dust previously alluded to; but much exists as small chaffy scales, with free borders still adherent to the subjacent layers of the epiderm. There is also a slight general swelling of the affected parts. The ordinary pliableness and motility of the skin being interfered with by the presence of so much dry and desquamating epidermis, numerous wrinkles and folds are produced, the latter being intensified by the attitude which the

horse, when not feeding, assumes under the incubus of the disease, as if directed to the continuance of a reflex action by the experience of relief from distressing symptoms which it doubtless occasions.

The folds are most conspicuous on the sides of the neck and on the withers, in which position they have a transverse disposition. They extend right across the mane and cause its free border to have a coarsely serrated outline. They are largely obliterated by depression of the head. The smaller irregular wrinkles extend over the whole surface of the affected area, being more pronounced where the disease is of longest duration.

Secondary Characters.—The chief local secondary results of the presence of the disease are excoriations of greater or less depth and extent, occasioned in the efforts to gain relief from the intense itching which it occasions. These are perhaps the worst feature of the disease and give rise to the raw and crusted patches in the bodies of affected animals, and the scabs which are ignorantly regarded as being directly associated with the affection. They are really only formed by effusions of serous fluid, afterwards consolidated as in ordinary skin abrasions. Sometimes, however, and especially as is commonly the case when these injuries occur on the wither, inflammatory products may be developed in considerable quantities, and more serious lesions arise from the burrowings of the resultant purulent fluid in its efforts to escape.

The chief constitutional results are an impairment of the condition of the animals affected, which become too restless and worried to take their food in ordinary quantities. This may show itself in various ways: horses which previous to being attacked by the disease were plump and hale become very poor, notwithstanding an abundance of fodder is at their disposal; fat bullocks may also fall away to nothing, and working bullocks be incapacitated from service. These results would no doubt be very much exaggerated were the seasons in which the disease occurred, otherwise than from a pastoralist's point of view, exceptionally good. Animals, however, do not invariably lose condition if possessed with such a temperament as will occasion them to feed, notwithstanding the annoying presence of the disease. It is satisfactory, however, to be able to confidently state that in the case of animals otherwise suitable for the slaughter-yard the presence of the disease in no way affects the wholesomeness of the carcass, and is as little injurious in this respect as is the occurrence of a few scale insects on the rind of an orange in influencing the luscious quality of the fruit. Moreover, except where deep abrasions or similar lesions have been made, the hide is in no way depreciated in the eyes of the leather-dresser.

Morbid Anatomy.—If a thin section is made, in the ordinary way, of a portion of the skin taken from a diseased patch in a living animal, and be suitably stained and rendered transparent, it will, provided that the different layers are thus brought under observation, be plainly evident that the disease is an entirely superficial one, and that both the corium or true skin, the subcutaneous cellular tissue, and their various component elements, as well as the sweat glands which they contain, and even the malpighian layer of the epidermis, are entirely normal in their appearance. In fact, the pathological condition is entirely restricted in its occurrence to the superficial or horny layers of the epidermis (cuticle or scarf-skin) and those bodies which are special developments of it—namely, the internal lining of the hair follicle and the hair itself.

In the case of the epidermis, instead of the regular contour which should define this externally being brought under notice, individual cells will be observed that have been arrested in the process of exfoliating, and similarly semi-detached and altered cuticle cells will be seen packed within the interval in the funnel-shaped epidermal depression which exists between the hair which arises from this depression and the walls of the latter. The hair itself,

as will be seen especially on separate examination of it, will be found often to be of uneven breadth and to have one or more swellings in its course; the bulbous enlargement of the root may be shortened and rounded, and immediately beyond it, at its union with the stem, it may be constricted. The medulla or central marrow of the hair is usually wanting at the basal portion, and when it occurs is often interrupted at different points along the axis of the hair.* When hairs are plucked from a diseased patch of skin, they usually either break off short or the root sheath is ruptured, the outer root sheath being left in the hair follicle. Not unfrequently some of the cortical scales of the hairs become detached, and this is especially so where enlargements occur in the course of the hair, for at these spots the hair cuticle is usually broken across.

The most remarkable feature, however, in all these bodies is the presence of very numerous round granule-like particles or minute cells. These, as seen with an ordinary ⅛ inch objective, occasion a clouded appearance, which may be made out as due to the presence of very minute objects. When cultivated apart or naturally occurring outside the structures which they infest, a high power of the microscope† brings to light the fact that they are really small round nucleated cells which occur singly in twos, or even in greater numbers, occasionally forming masses, and the component cells of these being apparently suspended in a gelatinous stroma, what are technically known as zooglœa. These, then, occur in the outer cells of the epithelium, especially those which are being discarded and those which immediately surround the hairs as they emerge from the skin, within the cells forming the inner root-sheath of the hair, and in the hair itself, both in that portion which is below the skin and that which is free from it. Here they apparently exist beneath the cuticular layer both on and within the fibrous portion. In the hair they are especially conspicuous in that part in which the medulla is absent; to this they give a curious finely freckled appearance, the markings often extending in short lines, which may be resolved into their component granules by altering the focus of the microscope, parallel to the longitudinal axis of the hair. If portions of scarf skin which have been naturally shed or been torn off be rendered transparent after previous treatment with potash, they will, on examination with a high power, display the presence of these little round bodies in immense numbers within their component cells. So, also, will the minute scab-like body which is formed, as has been previously mentioned, at the very onset of the disease. In fact, these cellular particles are invariably present in every tissue element which is included within the operation of the disease.‡ In particles of affected tissue, other fungus elements having much larger dimensions are not infrequently met with. These are (1) round bodies which are merely isolated minute cells which have become unusually large and which in growth may by transverse division directly form septate elongate sporidia, with septa corresponding in number to the frequency with which this process of division is repeated. These sporidia are frequently attenuated at one extremity, and both they and their component parts have a double contour. At other times they grow into (3) jointed threads or mycelia which

* This condition of the medulla taken by itself does not seem to denote any abnormal occurrence.

† In this investigation a combination of Hartnack and Pragmonski's No. 3 eye-piece and No. 9 immersion objective were employed, as affording the highest magnification available.

‡ These minute bodies are quite distinct from the granules, pigmentary or otherwise, which naturally occur in the more deeply situated cells of the epithelium or those which exist within the cells of the medulla of the hair. Comparison with the granules usually regarded as of fungus nature contained in the cells of the epithelial lining of the mouth is instructive as showing the distinctive characters of those especially under notice.

may be branched, and have often their terminal articles separated by constriction as elliptical spores (*conidia*). This mycelium is also eventually double-contoured and of uneven breadth. The walls of these fungus elements, especially in mature forms, are much darker in colour than are the minute cells, which are of a light greenish yellow. The latter appear to be swarm-spores, and are probably produced within the conidia or other forms of spores mentioned. They are competent of independent multiplication—also by fission.

It is important to consider what are these small bodies whose presence is so symptomatic of the disease under investigation. Without a doubt they are what in the case of a disease familiarly known amongst ourselves, and found under precisely similar circumstances in the hair and epidermis of human beings, have been described as constituting the "stroma" condition of a class of fungi which "produce most definite lesions, perfectly characteristic in hairy parts," and are stated to undoubtedly occasion the various vegetable parasitic diseases generally referred to under the term "ringworm." The essence of the disease, then, consists in the presence of minute organisms in the more superficial cells of the cuticle, and in the hair and its follicles, which are modifications of it.

Symptoms.—In addition to those described under the heading of general characters of the disease, the presence of epidermis and hair follicles affected by the fungus and dying, or in a dead state, occasions a continuous itching or pruritus, which is no doubt augmented by a slight turgescence and inflammation of the true skin arising from the same cause. This irritation seems especially felt at night. A writer in the *Queenslander* (3rd March, 1888) describes it as "worrying the unfortunate animals most cruelly: so that they rub themselves against anything they come near; they roll in agony upon the rough ground; they stand together in couples, head and tail, as they do when the flies are troublesome, but, instead of depending upon the tails to switch off the bothering flies, as is their custom, they bite each other's skin." Wherever there are leaning trees or accessible overhanging branches in a paddock in which affected stock occur, these are worn by the constant rubbing against them of afflicted animals, which stand for hours in the vicinity of these instruments of relief.

Cause.—Notwithstanding that investigation plainly demonstrates that the disease is a purely local one, being confined to the cuticle of the skin, and the probability therefore that the cause is not of a general nature, it were perhaps expedient to reply to the suggestion, which finds favour amongst many stock-owners, that it is a "*blood disease.*"* Such a conclusion is based on such observation as the following:—"We bled from eight to ten different horses (some very badly infected), and found in every case that about nine-tenths of the blood was *diseased.* After the blood was allowed to stand about five minutes, we found that the greater part was of a watery *sickly nature*, while only a very small portion indeed was *pure blood.*" In the case of those who are acquainted with the physiology of the blood and the changes undergone in it upon its removal from the body, these may pass over such an assertion without comment, for the conditions presumably implied in the expressions italicised will carry with them their proper interpretation. Much of the suspicion with which, no doubt, the appearance of the horse's blood when withdrawn has been regarded, has been engendered by the occurrence on the surface of it of what, in case of ourselves and other animals, would denote that this blood had been taken from such as were infected with inflammatory disease. Allusion is made to the well-known "Buffy Coat." Now, this occurs normally in the blood of horses which are perfectly healthy.

* For a statement of this view, *vide* letter in *Queensland Times*, Ipswich, 31st January, 1887.

In a work which is usually regarded as the most advanced exposition of the science of human physiology, it is stated that: "If before coagulation the blood corpuscles have time to sink, as is usually the case with the blood of the horse, the upper layer of the blood clot consists solely of fibrin, without corpuscles, and is therefore white and of closer texture than the red portion; this is called the "Buffy Coat."* But, admitting nevertheless the possibility of a peculiar condition of the blood as being a cause of the disease, we must then regard this condition to consist in, say, an altered state of the blood due to the circulation in it of a specific poison, either derived from some extraneous source (the evidence as to the existence of which, in the case of the occurrence of the present disease, is not forthcoming), or generated within the organism itself through the failure of some viscus, such as kidney, liver, or spleen, to fulfil its proper function of excreting matter the continued presence of which in the blood would exert a toxic influence. Now, the *post-mortem* examination of an animal selected as a typical example of one affected did not disclose any organic lesion in these viscera, which inferentially, therefore, were in a normal state of functional activity, nor are any concomitant constitutional diseases, whose presence might not be suspected from *post-mortem* examinations alone, invariably present; moreover, the disease is not of such a class as might be attributable to such a cause. Further, the general alteration of the condition of the blood without giving rise to loss of vitality or at least serious constitutional symptoms is too monstrous an idea to be entertained, that is, excepting normal changes (1) such as occur during the progress of alimentation, and which, as far as the serum is concerned, have been made the objects of investigation by Messrs. Bizzozero and Sanquirigo, and (2) the increase of acid, but not necessarily of acidity, which arises during oxidisation processes. A great authority on skin diseases, the late Dr. Tilbury Fox, in the chapter of his justly famous work which deals with etiology, has remarked that "there is much readiness to ascribe disease to changes in the blood, but not to sufficiently recognise the influence of perversions in the inherent cell-life of the skin structures."† But, still, viewing its causation from the same point of view, we might nevertheless inquire: Is the disease likely to have arisen from poverty of blood or from surfeit? The condition of the animals affected and the general profusion of "feed" do not admit of entertainment of the first suggestion, and as to surfeit no ailment having such a character as the one under investigation is now known to be has ever been traced to such a cause. The condition of the pasture, also, as a contributing cause may be considered in this connection. It has been "suggested that they (the grasses) may be deficient in some of the essential constituents"; and a writer in the *Queenslander* of 17th March, 1888, quotes a great authority on veterinary science, but whose acquaintance with the physiology of plants is evidently very limited, to show how this may arise, "that the nitrogenous elements of plants are readily soluble in water and may therefore be removed by wet."‡ How removed? it may be asked, especially in view of the fact (the common property of chemists nowadays) that albumen is only removed from fodder by exposure to wet after the latter has been cut down, and when fermentation or decay has already set in; and that even the amides and nitrates—the most easily removed of the other nitrogenous constituents—are not separated at all under even exceptional atmospheric conditions when the grass or other fodder is still standing. But then, again, the pasture shows every evidence of being perfectly healthy, and the fact that horses which have not access to any growing fodder yet contract the disease

* "Elements of Human Physiology," by D. L. Hermann, Eng. Trans., p. 51.
† "Skin Diseases," London, 1873, p. 50.
‡ George Fleming in "A Manual of Veterinary Sanitary Science and Police."

militates against the idea of regarding it as a cause of it even if it were otherwise.*

The appearance of some kind of fungus or mould on the hairs and wool of affected animals, which it has been suggested may be related to a similar condition in the fodder, has escaped our notice, unless it be the dust composed of fine particles of epidermis previously alluded to. But, notwithstanding, admitting that one of the fungi which reside in dead hair or wool may have been observed, the inference that the disease "may be caused by some kind of mould (vegetable parasite) formed on the grasses that the animals feed upon, this mould by some means getting into the hair of horses and cattle and the wool of sheep," is untenable when the facts known concerning the habits of fungi in relation to their hosts are borne in mind. Moreover, where the disease has been especially prevalent, it has been noticed that the fodder has been wonderfully free from parasitic fungi. The only examples noticed at Harrisville—viz., *Helminthosporium Ravenellii* on the grass, *Sporobolus* and *Sphærella destructiva* on lucerne, relate to fungi too commonly consumed by stock and horses with immunity to allow of us supposing that under any particular circumstance they developed pathogenetic properties.†

The conclusion that "the disease is the result of heat and damp,"‡ arrived at by the Chief Inspector of Stock, Victoria, after perusing whatever reports on the affection were available to him, cannot be taken as referring to an exciting cause, for it must have occurred to Mr. Curr that the association of heat and damp was no uncommon event even in Queensland, and that previously when it did transpire, horses and stock had not been noticed to be diseased as a consequence of such a contingency. Climatic influences do certainly give rise to skin affections, but these influences are malarial in their nature, and the class of maladies whose presence they give occasion to does not include any one having the general characters of this stock disease.

The term "mange," an unfortunate misnomer, has no doubt prompted the venture of the opinion that this skin affection is directly due to the presence of an acarus. The existence of such an arachnid in connection with the disease was assumed by John Pottie, V.S., in a meaningless article—*i.e.*, since his main proposition is absolutely incorrect—on "The Mange Epidemic," which appeared in the *Queenslander* of the 4th February. In this he nonsensically writes of it being "some particularly shaped little insect, the movements of which are too minute for the human eye, but they can be seen with a good microscope"—as if movement and size were not both apparently intensified by magnification. A Melbourne correspondent in the same Journal, 3rd March, 1888, having characterised this article as "bald and worthless," Mr. H. J. Pottie sends a report on the subject to the *Sydney Morning Herald* (*vide Queenslander*, 21st March). Therein he narrates the actual discovery of an acarus whose presence characterises what he regards as the third form of the disease. He writes as follows:—"The third form is that in which there is a true parasite closely resembling the *Sarcoptis (sic)*. This insect is now mounted at Sydney Museum, and may be seen by scientists. To Dr. Littleworth (? Lightoller), of Ipswich, Mr. Pottie is indebted for this insect specimen."

(*To be continued.*)

* A very good instance of a stabled horse being affected is afforded in a draught stallion, the property of Mr. Thomas Roderick, of Wilson's Plains. This horse is fed on hay and corn, never goes into a paddock; its exercise being taken in an ordinary stockyard.

† On the subject of the general nature of the prejudicial influences to be expected from the presence of fungi on fodder, see "Plants Poisonous to Stock—a Review," by Henry Tryon, p. 7, Brisbane, 1887.

‡ *Australasian* 17th March, 1888.

SOME CONTAGIOUS SKIN DISEASES OF THE HORSE.

BY WILLIAM ALSTON EDGAR, F.R.C.V.S., DARTFORD, PROFESSOR OF VETERINARY MEDICINE, COLLEGE OF AGRICULTURE, DOWNTON.

(*Continued from page* 113.)

Where chronic inflammations exist subsequent to treatment, a course of arsenic and iron will improve the tone of the skin, and daily dressings with a dilute aqueous solution of plumbi subacet. will be all the local treatment necessary.

Sanitary measures should be identical with those suggested in Ringworm.

The concluding portion of our subject—Phthiriasis—is generally dealt with by authors in a particularly summary manner, either from the difficulty of saying much about it or its assumed unimportance.

In rural practice, however, lousiness in horses is a constant source of annoyance to veterinarians and owners of stock. During the past winter pediculi have been almost a plague to horse-owners in some parts of Kent.

It is a common and absurd mistake to imagine—and singularly enough, most of our text-books support the theory—that pediculi only attack horses in insanitary stabling, and under conditions of poverty and neglect.

I have seen scores upon scores of the best agricultural horses in Kent attacked with the same readiness as those belonging to the nomadic individuals that wander from village to town, and are consequently exposed to every possible source of contagion.

A few months ago, in our practice, one owner—a very good horse-master—had seventeen horses attacked; the importance of the subject under such circumstances may be easily estimated, for not only do the animals thrive badly and lose their rest night and day, but the expense of effecting the destruction of lice in a large number of horses is considerable, even if the cost of chemical agents is left out of the question.

It is not a little remarkable that as each animal has its own specific acarus, so also has it a besetting pediculus—in some cases two or three species being guests to the one host; *e.g.*, man has the distinction of sheltering, on occasions, three species; the horse two, and occasionally a fellow boarder making a third; while many of the domesticated animals have two or more species.

By far the most common variety met with in the horse is Hæmatopinus equi. This group is represented in almost all the domesticated animals, at any rate in name. I have not met with this species in dog or sheep, but other observers have probably been more fortunate.

This is really the only truly parasitic species of the pediculi infesting our patients, as the other group, Trichodectes—also represented in all the domesticated animals, excepting, in my experience, the pig and cat—can only be regarded as a fellow-boarder, it having no anatomical convenience for attacking the tissues of its host, although, as will be subsequently shown, it can produce almost as much irritation as the formidable hæmatopinus.

I have included for comparison the pediculi commonly attacking man and the domesticated animals other than the horse, as it will be particularly interesting to know if, in the experience of our members, any of the species indicated are a cause of Phthiriasis on animals not forming the normal host.

In my own experience this transmission occurs only in the case of the horse, viz., Goniocotes from poultry, of which there are several cases on record.

The louse has the misfortune to belong to almost the lowest order of insecta, having only a very imperfect metamorphosis. Its large size, flat body, six pointed legs, terminating in well-developed hooks, and the body partially segmented at margins, distinguish it from any other form of parasite. The two groups, Hæmatopinus and Trichodectes, are differentiated chiefly by the former having a long pointed head, and proboscis armed with a delicate piercer

which enables it to puncture the skin for blood-sucking. In the latter the neck is short, the head somewhat triangular, in some species rounded.

When the pediculi or their eggs become lodged upon the skin, reproduction proceeds rapidly. Leeuwenhoek, in his experiments, found that two females produced 10,000 eggs in eight weeks. The lice quickly overrun the whole body, no part escaping their occupation excepting any portion from which the hair has been removed by clipping. It may here be noted that horses which are clipped early in the autumn rarely, if ever, become affected with Phthiriasis. Horses with long coats, however much they may be exposed to cold, are readily attacked. I have noted this especially during the past winter in the horses belonging to gipsies; they have suffered more than in any previous season that I remember.

This raises another point of interest, viz., the effect of wet seasons upon the extension of parasitic diseases due to ectozoa. Climatic influence in the development of vegetable epiphytes has already been noted, and it is well known that wet seasons favour the reproduction of some forms of entozoa at special points of their life history, and I have some reason to conclude, from observations during the past year, that this is equally true of some ectozoa, especially pediculi.

It is often a matter of difficulty to trace the source of infection. In many country districts there is a well-grounded supposition that barley straw is the source of evil. It is somewhat remarkable that Phthiriasis frequently follows the introduction of this kind of straw into the stabling and cattle yards; this I had noticed many times in my early connection with stock breeding, and it has been confirmed scores of times in professional life. I am unable to suggest any explanation, excepting that the ova of pediculi become in some extraordinary way stored in this special kind of straw. Of course, the common sources of extension which operate in all contagious diseases apply to those under notice, such as contact in fairs, markets, horse-boxes, etc., with affected animals, or the parasites or their ova may obtain an intermediary in the shape of harness, attendants, cats, and possibly vermin. The genus Goniocotes is obtained either by the stables being in direct contact with poultry houses, or the poultry being allowed to associate freely with the horses; the former, in my experience, is the most fruitful source of infection.

Removal of the cause in such cases generally has the desired effect, together with the application of some chemical dressing to the skins of the animals attacked.

Intense itching commences with the occupation and development of the parasites, and minute centres of depilation are noted, indiscriminately scattered all over the body and extremities; in no other disease does this peculiar loss of hair take place without any apparently important change in the skin, excepting occasionally in psoriasis. A case of the latter came under my notice in March, where the hair in a few weeks was entirely removed, producing large areas of baldness—in fact, the whole body was, more or less, denuded; there were no parasites present and no pruritus.

Where animals are attacked by Hæmatopinus equi, upon a close examination of the denuded parts small hæmorrhagic points may be noted in large numbers. After the louse has punctured the epidermis and sucked blood, a minute exudation takes place, but not sufficient, excepting in severe cases, to constitute vesication and eczema.

As in Scabies, severe injury is often done to the skin by the animal's vigorous efforts to allay the itching by friction; this quickly produces large areas of alopecia, and sometimes the epidermis is removed and the skin much damaged, even in a single night.

The variety Trichodectes produces less irritation when in small numbers, but as they increase the falling-off of the hair is very marked.

I was consulted respecting a horse a few days ago, which had lost almost all its hair on the neck, withers, and back; a patch of eczema existed on the withers, about three inches in diameter, and another in a semicircle around the tail; these patches were intensely itchy, and the owner suspected "Mange." Enormous numbers of trichodectes were present, deeply buried in the detritus of skin.

No difficulty exists in the destruction of pediculi where it is possible to have the hair closely clipped; but in the event of any objection to this operation, the process of destruction is often rendered tedious, as it is most difficult to work any dressing thoroughly into the long winter coat, and if this is not done the existing ova are not destroyed, although the mature lice may perish. After a few days fresh broods are hatched, and in a fortnight or three weeks the animal is covered by an entirely new family.

Clipping is sometimes difficult, owing to the restlessness of the animal, but it can in most cases be effected, after which the clippings should be destroyed at once by burning, and the animal washed thoroughly *all over* with an infusion of tobacco or staphisagriæ; this should be repeated again in a few days, in order to destroy any newly hatched ova. Sapo mollis, with an admixture of 10 per cent. of acid carbolic, forms a useful dressing, and is in addition thoroughly cleansing to the skin.

If the coat cannot be removed, it is safer to apply an oil dressing, *e.g.*, ol. picis, ol. tereb., and ol. lini., equal parts, or unguentum staphisagriæ; one application often effectually destroying both pediculi and ova.

Where animals have lost much flesh, and the skin is in a chronic state of inflammation from the secondary changes induced by rubbing and scratching, a course of mineral and vegetable tonics is advisable, in addition to an increase of albuminoid food.

The sanitary measures suggested in Ringworm and Scabies are equally useful in Phthiriasis.

The present occasion is peculiarly suitable for the discussion of our subject in relation to forensic medicine, as professionally we probably hold indefinite, if any, views as to the position of contagious skin diseases in the question of examination of horses as to soundness, and also their absence from the Contagious Diseases (Animals) Act.

So far as I have been able to follow veterinary jurisprudence, I know of only one action at law arising out of equine contagious skin diseases, viz., Scabies, recorded in the *Veterinarian* (vol. liv., p. 426, 1881).

The case arose from an alleged breach of warranty, and the plaintiff obtained a verdict for £18 with costs.

The "*scientific*" evidence in the case is a curiosity; a M.R.C.V.S. is reported as saying, "It (Mange) may originate from low condition;" "exposure might bring on the disease."

As there was no appeal from the verdict, we may probably presume that Scabies legally constitutes unsoundness.

Is this the opinion held by the majority of the profession? Is it the opinion of this Association?

This affection is not included in the C.D.(A.)A. Ovine Scabies is scheduled. Is it not equally reasonable that the equine form should also be under some legal control, in order that persons selling horses so affected may be responsible for losses arising therefrom?

If Scabies constitutes unsoundness, do Ringworm and Phthiriasis?

Ought either, both, or neither to be under legal control? Would such control facilitate their extermination?

If we are able to record some definite opinion upon the foregoing questions, I venture to think that the time spent upon the preparation and discussion of this paper will not have been altogether without results.

THE VIRUS OF RABIES.

PROFESSOR PEUCH, of the Toulouse Veterinary School, has been making some interesting and suggestive experiments with the virus of Rabies, the results of which are rather opposed to the views entertained with regard to the production or the presence of a special alkaloid in this viruliferous matter. He has ascertained, that if the liquid obtained by emulsifying the medulla oblongata of a rabid dog be filtered through porcelain, under a pressure of three atmospheres, that which passes through is destitute of potency, but that which remains on the filter communicates the disease.

A dog and three rabbits inoculated by intra-ocular injection with the non-filtered fluid, became rabid; the dog in twenty-two days, a rabbit on the eleventh day, another rabbit on the sixteenth day, and the third after twenty-seven days. On the other hand, a dog and three rabbits inoculated in the same way, but with the filtered fluid, experienced no ill effects.

This experiment clearly demonstrated that the rabaic virulence is not allied with the soluble substances found in the liquid, prepared and filtered as above.

It was deemed desirable to ascertain whether the animals inoculated with the filtered liquid had thereby acquired immunity against Rabies, whether, in fact, immunity results from a soluble protective matter. On May 3rd, forty-five days after the first experiment, the dog and rabbits were inoculated, intra-ocularly, with the medulla of a rabid guinea-pig, dissolved in distilled water. Four test guinea-pigs were inoculated at the same time and in the same manner. All these creatures became rabid, the first series as well as the last inoculated. On the 17th of May the dog was rabid; next day four guinea-pigs were attacked; on May 20th, a rabbit was affected; and on the 21st and 23rd of that month, the second and third rabbits were diseased.

From this it is concluded that the soluble matters contained in a filtered emulsion of virulent medulla do not possess rabific potency, and that virulence is the special attribute of the microbe of Rabies.

Peuch has been the first to demonstrate experimentally that animals inoculated with this filtered liquid are not protected against Rabies, though Pasteur had previously made experiments with regard to the filtration of rabific saliva, and Perroncito with that of rabific medulla oblongata.

ON THE DISEASES OF THE URINARY AND GENERATIVE ORGANS.*

BY A. E. MACGILLIVRAY, M.R.C.V.S., BANFF, N.B.

THE consideration of this subject was suggested by myself for various reasons; chief among which I may note the fact that I have given every attention to it for the last twenty-four years, during which period I have not only experimented and made myself practically conversant with a great many of the numerous diseases, surgical and otherwise, embraced within its limits, but have also often brought my ideas on the matter, whether original or acquired, under the notice of the profession in the pages of our veterinary periodicals.

Another reason for my selection of this topic for discussion is that, in my opinion, it has hitherto received but scant attention at the hands of the veterinary profession; the truth of this will be best seen by referring to the extreme prominence given to the study of the same subject by the *literati* of the medical profession, and then glancing at our own meagre literature on

* A paper prepared for discussion at the meeting of the National Veterinary Association in July, 1889.

the diseases of the genito-urinary system. It were needless to begin enumerating the valuable, extensive and exhaustive treatises which have been written by the medical profession on this interesting and important part of their duties, for their name is legion; but turning to our own profession we find little of any consequence except in the writings of Fleming, Williams, and Steel. True, we find now and again in our veterinary periodicals a communication or a paper with some original or practically useful suggestion or fact in reference to this class of diseases, but of a thoroughly exhaustive work on the subject veterinary literature is *minus*.

As a matter of course it is impossible, even if I were capable, for me to give even a faint outline of what would render the consideration of our subject-matter even partially complete, my limits forbid any such attempt. I will therefore cast aside all scientific classification of the diseases to be embraced in my paper, as well as all routine details in their discussion, and confine myself almost entirely to what I have either done or seen in my own practice. This I consider the safer and wiser course to adopt in bringing forward what is intended to be fully as much a popular as a scientific paper.

With these prefatory remarks I will now proceed to discuss the diseases which I have found affecting the generative organs in my patients. *Vaginitis* and *Balanitis* are analogous diseases in the male and female, consisting of inflammation to a greater or less extent of the mucous membrane of the more external organs of generation, as their names imply, and attended by a discharge varying in quantity and nature. In my own opinion and experience this inflammation may be either specific or simple, a fact which is not generally known or accredited as regards the lower animals, but which nevertheless is strictly true.

In *simple* Vaginitis and Balanitis we have first an increase in the depth of the colour of the mucous membrane of the vagina, penis, and prepuce; then a slight glairy (increased natural mucous) discharge with pain; and finally a discharge of laudable pus of yellow colour and creamy consistence. The disease, although mild, is very painful, and may arise from a variety of causes which I need not specify. It is comparatively common in all the lower animals, and is easily removed by very weak solutions of zinc sulphate, Goulard's extract, or an application of zinc ointment and vaseline.

Very different in its course and determination is what I must call the *specific* form of Balanitis and Vaginitis. No doubt the adoption of the attribute "specific" in this connection will be questioned, but when we find the diseased products from one patient producing the disease anew in another, we are forced to the conclusion that we have something specific to deal with; in fact we must fall back upon the old story of "like producing like"—which is certainly specific enough for our argument.

I have somewhere seen another designation for this contagious Vaginitis and Balanitis, namely, *Vaginitis impura*, etc., which is a very good definition of the disease in one respect, for it is an exceedingly impure and dirty affection; but when its products, by contact, produce similar lesions in similar organs of other subjects, we must argue that there is something quite evidently specific in its nature.

Balanitis and Vaginitis impura are then, we will say, a specific inflammation of the mucous membrane of the organs referred to, ushered in by an increase in the colour of the mucous membranes affected, which become a *brick* red instead of a deep violet red as in the simple form; in the first stage there is also often an eruption of small pustules or vesicles, which, however, soon degenerate into ulcerations of greater or less extent. These ulcerations are often of considerable size superficially, have yellow ragged edges, and ooze out thin watery pus, sometimes streaked with blood. When the disease runs on to this extent it is accompanied by considerable fever and great

pain and uneasiness, more especially during micturition, when the poor animal will sometimes become quite frantic, lying down and getting up as if suffering from colic.

This impure and contagious affection of the vagina and glans penis and prepuce is sometimes followed by rather serious consequences, which render its study all the more necessary and interesting to the veterinary profession; I refer to the fact that, when extensive ulceration exists and is not promptly and properly treated, the inflamed and ulcerated glans penis and inner prepuce *grow together quite firmly*, and so prevent the necessary extension or erection of the penis during copulation. I know of several very valuable shorthorn and black polled bulls that were rendered utterly useless by this untoward occurrence; and I have treated a good few that would have shared the same fate if they had not been very energetically handled. In like manner, and under similar conditions, the walls of the diseased vagina will sometimes get firmly attached for three or four inches or more at the *ostium vaginæ*, and thus produce complete occlusion of that organ. Either of these occurrences, but especially the former, is rather a serious matter pecuniarily and otherwise when it happens in a highly bred and pedigreed animal. In the horse and dog I have met with *paraphymosis* during an attack of this impure Balanitis; the glans penis having become so swelled that, with prepuce or sheath in a similar state, its retraction within the latter was utterly impossible. When much effusion was present in such cases I never hesitated about freely using the knife or lance, and following up with continued warm bathing. In dogs this condition is extremely painful, and calls for immediate relief.

The origin of this contagious form of Balanitis and Vaginitis is generally to be looked for in mares, cows, or bitches with an abnormal *uterine discharge*, such as patients affected with *Leucorrhœa*; it must be observed, however, that all leucorrhœal discharges have not this pernicious effect, and to say exactly when, how, and why this abnormal discharge becomes contagious is is more than I can do; of one thing I am certain, however, namely that in dozens of cases I have found it so.

The treatment consists in the injection of a pretty smart solution of copper sulphate with a slight dash of carbolic acid, but if much pain be present the latter may safely be omitted. This may have to be repeated.

In cases where adhesion of the inflamed and ulcerated mucous membranes is threatened, I apply very freely carbolised zinc ointment, and in severely obstinate cases add a little mercury nitrate ointment, which I find, in combination as above, very efficacious. This ointment is best applied smeared on to a soft moist sponge, which latter can be very conveniently introduced to the inflamed, ulcerated, or partially constricted passages, fastened to the end of a piece of cane. In the case of bulls this sponging is often rather a difficult matter, and to accomplish it properly I have many a time thrown down and secured the patient with ropes before attempting to do so; in such a position one gets the operation thoroughly done.

Advancing a step we find *urethritis* presenting itself for our consideration. In the medical profession this is a most important disease, but in veterinary practice, in so far as I am concerned, it occupies only a secondary position; I have, however, met with it in horses, cattle, and dogs. It may result from accident, or from the irritation produced during the passage of abnormal discharges from the bladder or kidneys; I have met with it in all three forms; and, curious to relate, I have been called on to treat several cases where complete occlusion of the urethra occurred in young cattle as a sequel to Urethritis. As a matter of course the passage of a catheter in such patients was simply impracticable and never attempted. In three of these cases the walls of the urethra, at the perineal portion of the penis, seemed either to

have given way or become immensely distended, in consequence of which a large fluctuating swelling appeared at the perineum, which I opened, and in two cases, improvised and introduced a metallic tube into the opening, and through this tube the urine was ever afterwards ejected! One of these patients continued to thrive and do well for eighteen months until it was fit for the butcher, and always passed its urine through the tube during the whole of that period, lifting the tail and roaching the back like a heifer! The other died in about a week after the introduction of the tube.

The tube was fully half an inch in length, and a quarter of an inch in diameter, and had about half an inch turned back at both ends at right angles to its body; one end was introduced into the wound and kept there by sutures in the common integument. The wound healed in a short time, enclosing the projecting part at the inner end of the tube, and thus rendered the escape of the latter impossible. The owner considered this case a complete wonder, and made quite a show of the "ox which was turned into a heifer."

Returning to our subject, however, we find the *treatment* of Urethritis in our patients rather a difficult affair, and almost entirely depending on the cause. If resulting from Prostatitis or Cystitis, or accompanying Vaginitis or Balanitis, the removal of either of these diseases must be a primary step, which being accomplished, the Urethritis, if merely sympathetic or the result of either of these affections, will also most likely disappear. Otherwise caustic injections of various sorts and powers will be necessary, but as I have said are rather difficult of application. I have used copper, zinc, and silver lotions as I thought most applicable, and always very mild, as I have ever had a dislike to the use of strong lotions in these cases; in mares and cows I have introduced zinc ointment into the urethra with my finger; and in one case, which I will hereafter refer to, a solution of carbolic acid in glycerine.

Prostatitis, except in canine practice, is not at all a daily occurrence in our profession, for which we cannot be too grateful, as in human practice it is comparatively common and generally very intractable to treatment. I have very little experience of this affection, except in dogs, having only seen three cases of it. It is, in the lower animals, a very obscure disease and scarcely ever dreamt of; but, if we meet with a case of urethral discharge of unknown origin and attended with difficult urination, we may suspect and look for disease of prostate which very generally ends in suppuration of the gland—the products of which escape either into the urethra or bladder.

In dogs prostatic enlargement, sometimes very great, is sure to cause difficult or even entire suppression of urination, and consequently distension and ultimate rupture of the bladder. This state of matters is very little amenable to any sort of treatment, even the passage of the catheter being in many cases almost impossible, and unless very cautiously gone about only aggravates the disease. In the dog we may feel the enlarged gland by introducing the finger into the rectum, but no surgical treatment can safely be adopted per rectum in the dog or, for that matter, almost any other animal, as although the enlarged gland be quite surcharged with pus, it is contained in numerous small individual (or isolated so to speak) cysts, and quite unfit for evacuation per knife.

Several years ago I had a most remarkable case in a two-year-old entire pony colt; when called to attend this animal I found the penis the seat of what appeared to be a great many abscesses, which were discharging matter freely; on endeavouring to thoroughly clean the organ with soap, water, and carbolic acid—the latter partly to keep down the frightful smell—I discovered that the anterior part of penis for fully three inches was entirely destroyed, being like a piece of sponge and literally riddled with pipes of pus. I amputated at once with no difficulty; I then cleaned as well as I could all

the remainder of penis and prepuce, and freely applied a strong caustic lotion; but all was of no avail, the poor creature dying two days afterwards. *Post-mortem* examination showed an immensely enlarged prostate gland, with pus oozing from it in every direction; bladder burst, and a large quantity of muddy fluid all through abdominal cavity—consisting of pus, urine, etc. In this case I have no doubt the disease began in the prostate and spread to the contiguous tissue of glans penis, etc. As to the origin of the prostatic affection or when it commenced, no information was to be got, as my client purchased it late at night the day before I was consulted, from an old gipsy woman, and never noticed till morning the serious state of what he called "its privates"! Verily, the old woman was quite a match for my client!

I don't think I need take up time referring to any sort of treatment for Prostatitis in our patients; cases amenable to treatment being only remarkable by their paucity—may be treated according to their merits—so to speak.

Fleshy growths and other *tumours* on the penis and in the vagina next come under observation; these are of various sorts and sizes; in the male often producing paraphymosis, and in the female completely blocking up the vagina. These tumours are very seldom malignant, in proof of which I have only met with two such during the last twenty-four years. When malignant their reproduction is very rapid; I remember excising one with the hot iron from the vagina of a mare, and in 48 hours it was bigger than ever, so she was sent to the knacker.

Benignant tumours of whatever description or size, and whether on penis or in vagina, I find most effectually removed by the actual cautery. I have removed by ligature and with the knife, and applied caustics to raw surface left, but I have almost always found the tumour reproduced, which never happens after the hot iron. Warts and other tumours, sometimes as large as one's hand, are often found on the glans penis of bulls, producing persistent paraphymosis; in removing these it is necessary to get an assistant (with a silk handkerchief) to firmly grasp the penis, the tumour is then removed with a sharp scissors and the raw spot left immediately cauterised with the hot iron. I have never seen these tumours reappear after such treatment.

If the tumour is entirely within the vaginal canal, never appearing outside except during or immediately after parturition, it must be pulled outside and a strong cord run through it and formed into a loop; putting traction on this loop the tumour is pulled wholly outside, and a sharp-edged hot iron used in gradually cutting through its base, which is often a mere finger-thick pedicle. I have never been bothered with hæmorrhage in these vaginal cases; but in performing on the penis the hæmorrhage is at times very great, and is best combated by injections into sheath of cold water and tincture of iron muriate.

Cysts of various dimensions are rather common in the vagina of the cow, but seldom in the mare, and are always a source of aggravation to the owner of the patient. I am entirely at a loss to account for their occurrence; they are generally composed of a very thin partially transparent capsule containing a light-coloured rather dense serum, which is sometimes not quite clear, but never has more than the slightest tinge of colour. The other day I met with quite a large cyst of this sort in a newly calved cow; this cyst was never seen until the cow began to calve, when the owner discovered what he took to be part of the "cow's bed" coming *before* the calf; being a large and very roomy cow, however, delivery was shortly accomplished in spite of this abnormality; but as soon as the cow lay down the alarmed owner noticed the cyst appearing beyond and outside the vulva, and, dreading prolapsus uteri, had the cow banked up behind. I was consulted the day after delivery, and on examination discovered a large and most beautiful cyst, with a very fine network of blood-vessels all over its walls, very much resembling

the outside of that important contiguous cyst—the bladder. Introducing my hand I distended the vulva and pressed part of the cyst well into view, and making a large slit with my knife in its walls, at once evacuated the whole contents. I have never seen these cysts reproduced. I should be glad if any of my readers could account for their appearance. These cysts vary much in their attachments, some having a very broad base and others hanging on by a mere pedicle; whether the one or the other, however, simple evacuation rids us of this abnormality.

The *os* and *cervix uteri* are subject to a number of diseased conditions; these may be either sympathetic or positively restricted to the locality. Simple catarrh of these parts is not a common event in veterinary practice, and need scarcely be noted; if met with, however, it may receive the same treatment as has been recommended for the like affection of the vagina. The cervix uteri is often the seat of a kind of Leucorrhœa, but as the later disease will be fully considered by itself, we need not here do more than mention it.

We have *occlusion* of the os and cervix uteri, both congenital and accidental, that is either at birth or resulting from disease or accident. The congenital form of this abnormality often gives rise to a most peculiar train of symptoms. The heifer (I have never seen it but once in a filly), when about one year old or a little more, begins to get unthrifty in appearance, to increase in abdominal bulk as if pregnant, although very likely never served; the latter symptom goes on increasing until one day severe tenesmus sets in. Owner thinks heifer is to calve, and wonders when she could have been served, and so on. A manual exploration and examination per vaginam generally reveals the fact of an occluded *os* and *cervix uteri* of variable extent. Finding this, I then explore per rectum to discover to what extent the uterus is distended; as a rule, if the heifer has never been served, the fluid contents of uterus in these cases is something enormous, so much so that the rectal exploration would lead one to suppose that there was nothing but the distended uterus within reach. In such instances I never hesitate about evacuating the abnormal uterine contents by the introduction of a trocar and cannula through the os and cervix uteri, that is to say if it is impossible to force through the constriction with one's finger or fingers. After this evacuation I wash out the uterus with a mild solution of carbolic acid, which may have to be repeated.

The other form of *atresia* of os and cervix uteri is quite a different affair, being generally only observed at parturition. It is known as stricture or scirrhus of os and cervix, and is most commonly found in either a hard cartilaginous or a soft fleshy state of these parts, but in either form quite unyielding. In so far as my experience goes the only remedy is the knife, the operation being known as vaginal hysterotomy; I have performed this operation very often, and have always been successful in all the cases where the abnormality was hard and cartilaginous, but where soft and fleshy my success has generally been confined to saving the offspring. The reason of this is apparently that, where the constriction is soft and fleshy, there is *active disease* of some sort present, which seems to be repugnant to any active or heroic interference, the operation in such cases being almost always followed by blood-poisoning and death.

We have both *cancer* and *tubercle* affecting the os and cervix uteri, but my space forbids me to do more than refer to them.

I therefore pass on to notice a sort of *Paralysis* of these parts, which I have observed after parturition; in these cases the os and the cervix don't assume their normal position but remain relaxed and open; and, if examined with a very powerful speculum, it will usually be found that the parts protrude or hang into the cavity of the vagina and appear quite flabby and inert. In so far as I have observed, no signs of local injury have been met with in these

paralysed parts, and no particular accompanying tenesmus or straining, but simply a great relaxation of the os and cervix and their extreme prolongation into the vagina; in fact, if patient be recumbent, the paralysed parts sometimes appear at the vulva. In one interesting case of this sort only the one side, or one half laterally, of os and cervix was paralysed, and appearing outside during recumbency greatly alarmed the owner. I could never fully satisfy myself as to the cause of this peculiar paralysis, and shall be glad if any one can suggest a probable theory as to its origin. The treatment adopted was nerve tonics internally, and carbolised glycerine or carbolised olive oil locally.

Passing beyond the os and cervix uteri we approach a most important disease, affecting, in general, the *uterus*, but also perhaps at times the cervix uteri; I refer to *Leucorrhœa, fluor albus*, or *the whites*. In my opinion this disease plays a far more serious part in reference to the breeding of cattle and horses than is commonly supposed; during the last twenty-four years I have known many a good and valuable animal rendered utterly useless, simply through neglecting an attack of Leucorrhœa, and on the other hand I have scored a good few remarkable cures of such cases in mares, where the disease had become disgustingly and dangerously predominant.

It is now a good many years since I wrote an article on *Leucorrhœa* for the *Veterinarian*, in which I entered pretty minutely into the origin, nature, symptoms, and treatment of this affection, but since then I have considerably simplified my ideas on the subject. In that paper I speak of three forms of Leucorrhœa, namely, vaginal, cervical, and uterine; but at present I am inclined to view the *uterus* as the only and true seat of the disease; the cervical and vaginal affections, if at all present, being only the result of the irritating passage through these parts of the diseased accumulations escaping from the uterus. Leucorrhœa is then, we will say, primarily a uterine disease, and is characterised by a more or less profuse but inconstant discharge from the organ of a muco-purulent, a purulent, or sanio-purulent nature, for I have never in our patients seen the purely mucous but abnormal discharge mentioned by medical writers; neither do I believe that the occasionally extremely white colour of the discharge is owing to the action of the acrid vaginal secretions on the abnormal mucous discharge from the uterus, as I have over and over again withdrawn this *light-coloured fluid* from the uterus direct with an elastic tube, thus thoroughly preventing its contact with the vaginal secretions. The amount and character of this discharge or "flow" will depend on the extent and nature of the uterine affection; and the latter will be ruled by the cause or causes, which may be both proximate and remote. For instance, a cow calves all right, but does not readily part with the *decidua*, which may be kept till the eighth or ninth day after parturition; this abnormal retention of the placenta causes a great deal of irritation and immensely increases the natural lochial discharge, which latter, if the cow have a tubercular or rheumatic diathesis, will likely degenerate into a confirmed leucorrhœal "flow;" and, if not promptly checked, the mucous coat of the uterus will become irreparably injured. Here the proximate cause is the retention of the decidual membranes or part thereof; the remote cause being the tubercular diathesis; for a great many cases of retention of decidua are not followed by Leucorrhœa, simply because the patients are thoroughly sound in every way.

The limits of this paper, however, compel me to refer to my previous communication (vide *Veterinarian* for November, 1872), for particulars as to the nature and proximate and remote causes of Leucorrhœa; so I will now pass on to notice the pernicious effects of this disease in extensive breeding establishments, and in doing so I will stick closely to facts which have occurred in my own practice or in consultation with some of my *confrères*.

I have before referred to a special form of Balanitis and Vaginitis of a contagious nature; now, I have no hesitation in asserting that the majority of such cases owe their origin to the contact of a bull or stallion with a cow or mare, as the case may be, while the latter have been affected with Leucorrhœa. Dozens of cases of this sort occur and are traced to their true origin; I will give one as an example. At a farm in this district where short-horns are bred several cows became very bad with impure Vaginitis; I was consulted and, on examining the cows, I volunteered the opinion that the bull was to blame, and that very likely he had been affected by some leucorrhœal subject. When the cattleman appeared, to take the bull out for inspection, he told us that the latter was unable to serve a cow that morning as he could not "draw" properly! I found the poor bull very bad with impure Balanitis and quite unable to erect his penis—adhesion having evidently already commenced between that organ and the prepuce, so that he must have been badly for some time. Being rather a refractory animal it was impossible to satisfactorily treat this bull without casting him, which I did no less than three times, and used every means in my power to render him again fit for service; but all was of no use, the poor brute could never again "draw" to accomplish the purpose for which he was kept. In this case the adhesions between the glans penis and prepuce were too firm for removal by even the most energetic treatment, having evidently been too long neglected. On investigation it was discovered that the bull had contracted the disease while serving a cow with a bad and long-standing discharge, from a neighbouring farm, which cow with two of her offspring ultimately succumbed to Tuberculosis!

This bull was a very valuable animal, having gained several prizes, and proved himself a good stock getter. I may here mention that I afterwards treated this disease-spreading cow on two different occasions (a year between) for uterine Leucorrhœa; so that cows with a tubercular diathesis may be set down as very readily falling victims to this affection after calving, abortion, or missing of service, or more properly speaking checked fecundation.

I remember another very superior bull, worth some 500 guineas, being rendered useless from the same cause, but I could never trace the origin of the affection in his case, as he was badly before coming into my client's hands. But it is needless to enumerate these untoward instances, aggravating alike to owner and veterinary attendant.

It is a problem worth considerable close investigation whether or not these cows with a leucorrhœal discharge are not often the cause of those mysterious outbreaks of abortion in valuable and well housed, well fed, and well attended herds; the ante-partum and post-partum discharges in these cases look extremely provocative of fostering this idea; and I have myself a good deal of practical experience of the benefits to be derived from profuse antiseptic injections, both in cows and bulls, as a preventive of a continuance of these abortions. The abortion question is serious enough to excuse my giving the following particulars of the events preceding two years of wholesale abortion on an extensive and well-stocked farm.

A very fine polled bull contracted impure Balanitis from a neighbouring farmer's cow *with Leucorrhœa*, and in course of time infected several cows at home, all of which were severely and successfully treated by me for impure Vaginitis. This bull was a peculiar case, in so far as, after recovering from the local affection, he broke out in large blotches all over his body; there were dozens of these blotches on him at one time, all oozing out thin acrid matter; he got over it all, however. But mark the unfortunate results in this herd, which had previously been a most successful breeding one, *nearly all the cows and heifers aborted when from five to seven months pregnant!*

Three or four of the seven months' calves lived and did well, and almost all the aborted fœtuses were alive when brought forth. The abortions continued during a second season, not only among home-bred cows and heifers, but also among several bought-in females.

Now, we can scarcely help seeing some connection between the preceding impure disease of part of the generative organs and this untoward outbreak of abortion; the latter occurrence is commonly supposed to be caused by the presence of some irritating or abnormal material or force *in utero*, but I have never been able to satisfactorily account to myself what that abnormal material or force consisted of or was caused by. The theories as to the origin of abortion are numerous and conflicting and so much discussed that I don't intend here specially referring to them; but considering the appearance, nature, and character of ante- and post-partum discharges in most abortion cases, I think it is quite reasonable to argue that the connection between the prior impure and contagious disease of the male and female generative organs and the subsequent abortion and its sequelæ is but too evident. We are all practically conversant with the nasty post-partum lochia, often profuse and persistent, in the generality of abortion cases, and we know quite well what happens if a bull be allowed access to these aborted cows, with impure discharges, and then to healthy cows; what? Usually impure Vaginitis, followed by abortion, and so on *ad infinitum*.

A client of mine, who suffered serious loss by abortion among his cows, once told me that he thought he could stop the abortion by washing out the uterus of every cow about his place with a weak solution of carbolic acid, and at same time thoroughly lime-washing his cow byres: I willingly coincided with my client's opinion, but said the uterine ablutions would be rather difficult to successfully accomplish. I have in dozens of cases used a very mild solution of copper sulphate, with or without the addition of a little carbolic acid, for the same purpose as that proposed by my client, and I can confidently recommend its adoption in such circumstances.

The *treatment* of Leucorrhœa, if early adopted and persistently pushed, is usually a very simple matter and, in so far as I am concerned, always consists of washing out the uterus with a mild solution of copper sulphate and carbolic acid. As a matter of course if the uterus be surcharged with diseased fluid material, the latter must be evacuated before injecting the above solution, and in some cases (in mares) the quantity evacuated will be something enormous. In very obstinate cases I sometimes administer twice a day, either in ball or powder, dram doses of copper sulphate. In mares I have never seen the disease recur; but in cows with a tubercular diathesis this affection will occur again and again under the slightest provocation, and in such subjects it is the most dangerous.

The *uterus* is liable to a variety of other diseases, such as *endo-* and *peri-metritis*; *hydrops uteri*, which is often confined to the decidual membranes or placenta; *tumours*, and different phases of *tubercle;* but I will not here discuss these subjects.

Disease of the *Ovaries* in our patients is rare and very difficult of diagnosis; I have only observed ovarian *dropsy* (cystic and otherwise), and deposits of tubercular matter, the latter causing an alarming and almost continual œstration which is known as *Nymphomania*.

From the ovaries I will pass on to the *Testicles*, which are liable to a variety of diseases very common and of great importance in human practice, but the reverse in our profession, our patients not being so liable to contract the "ills" peculiar to these parts: *swelled testicles* is a sort of generic term, embracing a good many diseases such as *orchitis*, *sarcocele* of more than one description, *hydrocele*, *hæmatocele*, *epididymitis*, etc.; all these I have met in either horse, bull, or dog.

I draw a line between Orchitis and Epididymitis, although some writers use these terms indiscriminately; the former I restrict to inflammation of the testicle, *per se*, leaving epididymitis to stand on its own legs, so to speak. Orchitis in our patients generally results from injuries or tubercle, more commonly the former. Pure inflammation of the testicle, without effusion into tunica vaginalis, is a very painful affair, more especially if caused by injuries; swelling, heat, extreme tenderness, fever, and inappetence, are the symptoms usually observed in our patients during an attack of simple Orchitis, and is most successfully combated either with anodynes or iodine liniment, or first the one and then the other. Under such treatment resolution may, and often does, take place; otherwise suppuration of the body of the testicle may occur and require free evacuation and very likely subsequent removal; I have seen a good few such cases in young calves, where, after recovery, I have almost invariably removed the testicle or testicles. In canine Orchitis I have observed effusion into tunica vaginalis, not Hydrocele, and in such instances the inflammation has generally been subacute and a sort of chronic. Apply a mild preparation of iodine, and administer repeated doses of potassium iodide.

Tubercular Orchitis is far from uncommon, and may be set down as a very serious matter, being incurable and unquestionably the means of propagating or spreading Tubercle. I have met with this form of swelled testicle in cattle and pigs, and in the former the tubercular testicle sometimes becomes enormously enlarged; I have removed one as heavy as 8 lbs.! As a rule, however, it is rather dangerous practice removing tubercular testicles; as, if the disease exist any considerable distance beyond the testicle and up the cord, death is almost certain to occur; I speak from dire experience. I remember a case of a boar with tubercle-laden testicles, whose offspring were very prone to fall away under the various forms of "ulcers," as the owners termed it! This boar was castrated, but he survived the operation and was subsequently fed.

Epididymitis, which I have purposely kept by itself, consists of inflammation of that important appendage (or efferent vessel) to the testicle called the epididymis, and is generally the result of injury, tubercle, or through sympathy with or actual extension of Orchitis. The most interesting thing about this affection is that it is often the cause of the loss of the procreative powers; either during the progress of the inflammatory action, or as a result or effect thereof, the tubes composing the epididymis (globus major and minor) become permanently blocked, thus thoroughly preventing the passage of the semen from the testicle to the vesiculæ seminalis and the urethra. This is a most important consideration, and is brought forward as the result of practical experience during post-mortems. This occlusion of the epididymis is sometimes incomplete, a very limited supply of semen finding its way to its natural receptacle and channel for ejection; but whether partial or complete it very much depreciates the value of the animal, and in the one case renders him useless as a stud animal.

Having settled the presence of Epididymitis, the treatment will be analogous to that for Orchitis.

Hydrocele and *Hæmatocele* of the testicles (so to speak) are apt to be confounded in our patients, but can scarcely be so in human practice; the swelling in the hydrocele, however, is softer and more fluctuating and attended with less pain than the rather more circumscribed swelling in hæmatocele, which in a very short time will lose its fluctuating feeling, and, becoming firmer, will pit on pressure.

Hydrocele is an abnormal collection of clear watery fluid in the cavity or sac formed by the tunica vaginalis testis; while Hæmatocele is an engorgement of the same sac or cavity with blood; hæmatocele may be and very

generally is primarily the result of an injury; but Hydrocele is commonly dependent on some previous disease of the testicle or its membranes or tunics.

In Hydrocele of the lower animals the only advisable treatment is to evacuate the fluid and then inject the cavity with iodine tincture; destruction of the secreting membrane, adhesion, and obliteration of the cavity follow, thus preventing any return of the disease. In Hæmatocele at an early stage evacuation is inadmissible, as the internal primary and causative hæmorrhage will very likely recommence; it is best, therefore, to apply evaporating lotions for some time, and if absorption do not follow, then apply iodine in some suitable form. If the blood be not ultimately reabsorbed suppuration will almost certainly occur, in which case, as in Hydrocele, the cavity will cease to exist. I remember an interesting case of hæmatocele testis in a seven-year-old stallion, the result of a kick from a mare. I recommended cooling and, as much pain existed, anodyne applications, and in a few days the abnormal collection of blood in the tunica vaginalis was entirely reabsorbed, and my patient again on his rounds. Another case in in a dog ended in suppuration, and subsequent atrophy of the testicle.

Sarcocele is not a common occurrence in veterinary practice, but has been met with in three forms, namely, a fibro-vascular enlargement of testis of either a malignant or benignant description, and the tubercular form; the latter being not at all infrequent. But whether malignant, benignant, or tubercular, the only treatment consists in excision, and the sooner the better. Before operating care must be taken not to confound either of the two previous affections with Sarcocele. I saw a case lately in a pure short-horned bull where both testicles were affected with fibro-vascular Sarcocele; an empiric had been called in and he had *lanced* both sides of scrotum, expecting to find *matter*, but no, only *proud flesh*, as he called it, jutted out at the two incisions! As the bull was fat I advised slaughter; for, although of very high pedigree, he had never had any offspring, the Sarcocele having evidently been begun in both testicles before his arrival as a yearling, at the farm where I saw him, he being then two years old.

It would be a very interesting study to follow out the various causes of sterility or non-productiveness in the various lower animals, more especially in males; it is certain that the Sarcocele was the cause in this highly bred two-year-old bull. (*To be continued.*)

THIOCAMF—A NEW DISINFECTANT MATERIAL.

In "Notes on Science in Practice," Professor Emerson Reynolds, M.D., F.R.S., gave an account of this new agent at the last meeting of the Royal Dublin Society on June 22nd. He said: "Since writing the chapter on Disinfection in the *Manual of Public Health for Ireland* I have sought some simpler means than is there recommended for disinfection of rooms, so that any intelligent person could attain the end in view without risk of fire, without the use of corrosive materials, or of large quantities of any agents, and without involving the presence of the operator in the room, or the employment of special apparatus. This search has been successful, and I have now the pleasure of bringing under your notice the singular liquid which fulfils the conditions I have just specified, and to which the name of 'thiocamf' has been given. The basis of this novel disinfectant is a very curious liquid which results when sulphur dioxide gas is brought in contact with camphor. At ordinary temperatures the gas alone requires a pressure of more than two atmospheres to liquefy it; but camphor, owing to chemical attraction, can liquefy the sulphur dioxide gas without any pressure whatever. In this

liquid are dissolved several powerful substances, but I am not free to enter into further particulars, as the patent specification for thiocamf has not yet been published. A quantity of the liquid has been preserved in my laboratory for nearly two years in a corked bottle, and has not undergone sensible alteration during that time.

"Thiocamf possesses almost unique properties, for while it can be preserved without pressure in ordinary bottles at mean temperature, mere exposure of the liquid in a thin layer to the air determines the steady evolution of relatively enormous volumes of sulphur dioxide gas from it, charged with the vapours of other powerful disinfectants. These gases and vapours diffuse through the whole of the air of a well-closed room, and therefore must reach everything in the room if given reasonable time. The question then arises whether the sulphur dioxide gas can destroy the bacteria, particularly infective forms, when it reaches them. The evidence on this point has hitherto been of a rather loose kind, though the results lead to the conclusion that sulphur dioxide gas is a powerful bactericide. Happily, the truth of this conclusion has now been placed beyond doubt by a critical investigation of the subject aided by modern methods of bacteriological study. This examination has been carried out in Paris by MM. Dubief and Bruhl, under the direction of Dr. Dujardin-Beaumetz, and the results have been recently communicated to the Academy of Sciences. Starting with air rich in germs, and combining Miguel's method of numbering the bacteria with alkaline culture, Dubief and Bruhl found that the germs were always reduced in number after the action of dilute sulphur dioxide gas; therefore the latter destroyed the vitality of the germs. It was further found that the number destroyed increased with the duration of the action of the gas, and that this destructive action was accelerated when the humidity of the air was increased. In all the experiments with the rather dilute sulphur dioxide gas used the latter proved particularly fatal to micrococci and allied bacteria, whether diffused through the air of a chamber or attached to its walls. As these are organisms of the class which true disinfection seeks to destroy, this testimony to the value of sulphur dioxide is of exceptional importance. Lastly, these investigations have shown that sulphur dioxide gas is a true bactericide even in a dry state, though longer time is then required for the production of its full effect.

"The bearing of these results on the value of thiocamf is obvious, for if sulphur dioxide gas alone be so powerful a bactericide, the mixture of sulphur dioxide with vapours of other disinfectants of acknowledged value is a combination of exceptional power. Moreover, there is no material that I know of except thiocamf which can give off so large a relative volume of sulphur dioxide gas (the contents of a small six-ounce bottle can afford over 20,000 cubic centimètres) without any special treatment save exposure in a very thin layer on an old tray or dish to the air of a room to be disinfected. Further, one ounce of thiocamf shaken up with a quart of water forms a powerful disinfectant for ordinary purposes, such as sprinkling over various matters, purifying drains, etc.; while a still more dilute solution (one ounce to a gallon) can be used for soaking clothes which have been in contact with infected persons. The residue of thiocamf has a pleasant aromatic odour.

"This concentrated disinfectant can now be produced at a cheap rate, and an apparatus has been erected for its manufacture which can afford several hundredweight of thiocamf per week."

SECOND CONGRESS FOR THE STUDY OF TUBERCULOSIS.

WE are asked to announce that the subjects to be discussed at this Congress, which is to be held at Paris towards the end of July, 1890, under the Presidency of Professor Villemin, are as follows :—

1. The identity of Tuberculosis in mankind and bovines, poultry, and other creatures.
2. The bacteridian and morbid accompaniments of Tuberculosis.
3. The hospitalisation of tuberculous patients.
4. The innocuous agents capable of destroying Koch's bacillus, from a prophylactic and therapeutic point of view with regard to human and animal Tuberculosis.

THE FITZWYGRAM PRIZE COMPETITION.

THE competition for these prizes took place in London and Edinburgh on June 12th and 13th for the written portion, and at Aldershot on July 30th for the practical portion. Ten competitors presented themselves, and the result was that Mr. A. E. Mettam (Dick Veterinary College) was awarded the 1st prize (£50); J. B. Robertson (New Veterinary College) the 2nd prize (£30); and E. E. Martin (Royal Veterinary College) the 3rd prize (£20). The examiners were R. Poyser, F.R.C.V.S, Army Veterinary Department, and A. Robinson, F.R.C.V.S., Greenock.

Proceedings of Veterinary Medical Societies, &c.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE summer quarterly meeting of this Society was held on July 19th, at the Queen's Hotel, Leeds, the President, Mr. W. Lodge (Dewsbury) in the chair; and there were also present Messrs. Jos. Carter (Bradford), G. Carter (Keighley), A. W. Briggs (Halifax), A. W. Mason, G. Bowman, and W. F. Greenhalgh, Hon. Sec. (Leeds), Mr. J. Scriven, Hon. Treasurer (Tadcaster), H. Snarry and G. T. Pickering (York), G. Clarkson (Aberford), S. Chambers (Kirkheaton), members of the Society; and Dr. Watts (Medical Officer of Health, Dewsbury), Mr. T. Exley, M.R.C.V.S., Mr. E. Anderton, and Mr. P. F. Falshaw, visitors.

Letters of apology for non-attendance were read from Professor Axe, Messrs. Bale (Otley), Axe (Doncaster), Longhurst (Hull), Kidd (Hungerford), Deighton (Riccal), Danby (Bainton), Hardy (York), Greaves and Faulkner (Manchester), Scott (Harrogate), Frear (Uppingham), and A. Leather (Liverpool).

Mr. G. CARTER proposed Mr. Longhurst (Hull) as a member of the Society. Seconded by Mr. MASON, and carried.

Mr. SCRIVEN proposed Mr. Gavin Scott (Scarborough) as a member Seconded by Mr. MASON, and carried.

Mr. GREENHALGH nominated Mr. T. Exley (Leeds) as a member of the Society

Empirics as Meat Inspectors.

At the last meeting of the Society a committee was appointed to consider the question of the appointment of empirics as meat inspectors, etc., and the recommendation of the committee was submitted in the following form for adoption :—

"At a meeting of the Yorkshire Veterinary Medical Association, held in Leeds on July 18th, the question of official meat inspection and of the over-

sight of cow-sheds and dairies was introduced and discussed. It was decided then to point out to the various local sanitary authorities throughout Yorkshire the importance of these matters, and the necessity for substituting duly qualified veterinary surgeons for policemen and empirics generally as meat inspectors, and at the same time to recommend to the various sanitary authorities the advantages which must accrue from such a reform of the existing arrangements. The reasons set forth were that an efficient inspector of meat must, *prima facie*, be a good comparative pathologist. That the superficial knowledge of meat inspection displayed by policemen and empirics is an item of serious danger to the public health, and not infrequently is attended with unfairness to the butcher. That it is essential for the proper inspection of butchers' meat that an extensive and definite knowledge of anatomy—such only as a complete course of veterinary studies can guarantee—should be exercised. That only those who have thoroughly studied the structure, composition, and general features of animals in health and in disease, by the aid of chemistry, the microscope, and other scientific methods and accessories of investigation, such as modern science has placed in the hands of the veterinarian, are competent to pronounce upon the soundness or unsoundness of the flesh of animals for human consumption."

Mr. J. CARTER expressed the opinion that the recommendation of the committee was a step in the right direction, but he was afraid more pressure would have to be put on the local authorities before they adopted it.

Mr. G. CARTER remarked that the subject had been well considered by the committee, and they came to the conclusion that the recommendation, as drawn out by Mr. Briggs, was such as the Society intended should be placed before them. There had also been an expression of opinion that if the various hon. secretaries of the different veterinary medical societies throughout the country would bring the matter forward for discussion at their meetings, and pass a similar resolution to that which had now been submitted, it would be productive of very great benefit to the profession. (Hear, hear.) He proposed that the resolution of the committee be adopted and acted upon.

This was seconded by Mr. MASON, who thought the secretaries of the various veterinary societies might inform them as to any action those societies might take.

The resolution was carried unanimously.

Notice to Members.

The PRESIDENT stated that there was a rule in the Society to the effect that members not attending and not sending apologies should be fined, and he thought it desirable that in future the rule should be put into effect.

A Specimen.

Mr. BRIGGS exhibited bones showing a fracture of the atlas and dentata.

The PRESIDENT then read the following paper on

Tuberculosis.

GENTLEMEN,—In introducing the subject of Tuberculosis for your consideration, I must confess to some amount of hesitation and doubt; for it is a matter of the deepest importance, and ought to be dealt with most painstakingly by myself and also by you, my brethren of the profession. I hope, however, you will excuse any shortcomings in this address, and I trust it may be the means of inducing the veterinary profession in Yorkshire to declare what are their views respecting a disease so prevalent as this is among horned cattle, and especially among milch cows. Let me say I am quite convinced it is time the veterinary profession should see that some steps are taken to eradicate entirely out of the country this most baneful disease. You ought also, I think,

to come to some definite understanding as to who are most competent to give authentic, and therefore reliable, opinions as to this disease when its existence is suspected or alleged, and should be scientifically investigated. It is a baneful malady peculiar to cattle, and is it not discreditable in the eyes of the public that when called upon to give evidence before the magistrates, veterinary surgeons are often found giving conflicting evidence upon a state of facts which are admitted by both sides to be accurate? Can we depend upon having the confidence and respect of our clients so long as such is the case? It is in order if possible to avoid such a contrariety of opinion, especially in the presence of judicial tribunals, that I invite you to assist me in a thorough and enlightened deliberation as to what Tuberculosis really is, what it leads to, and what is the prerogative of the veterinary surgeon when cases of this kind arise. Not only do I hope there will be an animated and exhaustive discussion to-day, but that even after this meeting is over, should any fresh experience arise or additional knowledge be obtained, those of us who are in possession of it will take care that it is recorded as early as possible in the recognised public journals devoted to the profession. In reading over the evidence in the recent diseased meat case at Glasgow, I was very much surprised to find that nearly all the inspectors of meat whose evidence was taken were medical gentlemen. Now, with all respect to them, I am compelled to say that I cannot for the life of me understand why they allow themselves to be placed in a position which, even from the point of professional etiquette, they ought to shun. If their candour were appealed to they would, I doubt not, admit that we have a domain of our own, and rights and privileges exclusively ours, and why they should intrude upon them entirely passes my understanding. Men like ourselves, gentlemen who are trained and skilled as to soundness of animal flesh, cannot but be more competent to give evidence in cases like that I have referred to than the family surgeon, who is only asked to interfere in such matters occasionally, and in order to bolster up a doubtful case. There are, I contend, abundant reasons why veterinary surgeons should exclusively be admitted as professional witnesses in such cases, and more particularly why they alone should be called to the office of meat inspector. (Applause.) Let me ask you now, gentlemen, to consider with me what Tuberculosis is, and I would propound to you the following questions: 1. What is Tuberculosis? and how does it affect cattle? 2. Is it infectious? 3. Is it possible to be taken into the system by ingestion? 4. Is it hereditary? 5. Would you consider the milk fit for human consumption if taken from a cow affected with Tuberculosis, whether the udder is affected or not? 6. Would you consider the flesh of an animal affected with Tuberculosis, either in its first or the advanced stage, fit for human food? 7. Is it essential that Tuberculosis should be brought within the operation and provisions of the Contagious Diseases (Animals) Act, with a view especially to compensation being paid to the owners of animals which have to be compulsorily slaughtered? As to the first point, my definition of Tuberculosis is that it is a febrile disease, attended with greater or less diffusion of granular deposits, which give rise to a slow local inflammation by the irritation which they excite. You will often find narrow-chested animals with long legs those in which the disease is most apparent. You will notice that they hang down their heads, and have a weak, hoarse cough, which is repeated if they are driven about quickly; the eyes often are bright and staring, the skin dry and harsh; and if the animal be a white one, the skin, it will frequently be perceived, is of a yellow colour. They are, as a rule, capricious feeders; the bowels respond too easily to the action of laxatives; and the milk, besides being thin and bluish, is sometimes sour; while in pregnant animals abortion ensues, and in other cases irregular œstrum occurs. 2. Is it infectious? In my opinion there can be no doubt that it is very infectious. I have seen

several cases on one farm. The farmer has kept a cow suffering from Tuberculosis for some time, and gradually the disease has extended to the others. As to the third proposition—Is it possible this disease can be taken into the system by ingestion?—I must admit that upon this point I am not prepared to give a definite answer. I must declare it to be my opinion, however, that the disease can be taken into the system by ingestion. Now, my fourth point is, Is it hereditary? My opinion is in the affirmative, but at the same time I have no proof to adduce further than in particular breeds—shorthorns, for instance—it appears to be most prevalent. Fifthly, Would you consider the milk fit for human consumption if taken from a cow suffering from Tuberculosis, whether the udder is affected or not? Now, I certainly think that the milk taken from a cow affected with Tuberculosis should not be used for family purposes. In several cases I have ordered to be destroyed animals which had become wasted and very thin, although they were giving milk rather freely. If we reflect for a moment how much the juvenile population are nurtured upon milk, we shall feel in honour bound to protect them as respects the wholesomeness of the food administered to them. I would not for a moment declare that tuberculous matter would produce Phthisis, but I am perfectly sure that it is very likely to bring on diarrhœa and sickness. In the cases of children fed from a bottle, is it not frequently the case that they look pallid and emaciated? and may not this be the result of the liquid they are imbibing being either diseased or too much diluted? Now, coming to the sixth suggestion I threw out, I must avow I do not consider animal flesh fit for human food if impregnated with Tuberculosis to any extent. Mind you. I use the proviso "to any extent," by which I intend to convey that when an animal has become wasted and nearly all the organs of the body are more or less diseased, then the meat should not be allowed to come into the market; but I do think when an animal is fat and in good condition, and when the lungs are the only parts affected, then I think the carcase might be used for human food. In such circumstances we often find the tubercle encysted, or that it has become of a cheesy nature, in which case I consider no harm could be done. On the other hand, however, so soon as the glands indicate the presence of the disease I believe that the virus is on the march, and will soon do its pernicious work. As to the seventh point which I have offered for your consideration, I must say that I consider it very essential for the welfare of the country at large that Tuberculosis should be comprehended within the Contagious Diseases (Animals) Act, whereby I think the most effectual means would be provided of stamping the disease out. It is my belief that an aged cow kept upon a place for any length of time affected with Tuberculosis is likely to be very contagious to the neighbourhood. If there were legal powers to prevent such an occurrence as this the milk consumers would most likely have the advantage, to a greater extent than at present, of being supplied with good pure milk, and they might possibly also have the satisfaction of recognising a surface of cream such as rarely at present comes within their culinary experience. Now, thanking you, gentlemen, for your kind attention to these remarks, and sincerely hoping that good results may ensue, both to our own profession and to the public at large, I have now to invite discussion on this subject, which all must admit is of national and paramount importance.

Mr. J. CARTER thought the subject of Tuberculosis required a great deal of investigation. It was quite time something should be done in the matter. Very few members of the profession had perhaps seen so many cases of Tuberculosis as he had, and there was no doubt that where the disease existed in an advanced stage the meat should not be used for human food. He had seen two cases recently at York. The animals had only been purchased three weeks, but the lungs of one animal bore abscesses the size of

his hand, but they were not altogether hollow. The animal was nearly a skeleton. The other was nearly as bad, and the milk from or meat of such animals was unfit for food.

Mr. MASON remarked that he was connected with the celebrated Glasgow case. He believed the great question they had to consider was at what stage of the disease they should condemn, and at which pass. The lungs of one of the animals were affected, but they were firm, and the disease was in the encysted stage. The carcase of such a beast he should have felt justified in certifying as fit for food. With regard to the other, he could find out nothing about it; there was no disease about it whatever. There was a rosy hue on the left costal membrane, but they often found that in the case of animals that had been over-driven, and there was no organic disease whatever about the carcase, in fact it was one of the grandest carcases he had ever seen. They, he believed, as veterinary surgeons, had always passed carcases as fit for food when the animal was suffering from Tuberculosis in the early stage, but the scientific gentlemen who gave evidence at Glasgow stated that it did not matter in what stage; an animal suffering from Tuberculosis must be condemned and the flesh destroyed, as it was not fit for human food. It was clear that even amongst themselves as veterinary surgeons, there was great difference of opinion at present as to at what stage an animal suffering from Tuberculosis should be condemned as unfit for food. In his opinion they had a good deal yet to learn as to this disease, and no satisfactory conclusion could be arrived at until there had been much more scientific research, and the subject had been thoroughly thrashed out. He thought great credit was due to their President for having brought the subject before them for discussion.

Mr. SCRIVEN expressed the opinion that domestication under certain conditions conduced to the disease.

Mr. MASON asked if any of those present agreed with him that the disease was more prevalent now than it used to be. He would like to know whether they thought the present mode of feeding and housing had anything to do with the disease.

Mr. J. CARTER said he found the disease more prevalent among the thorough-bred short-horn breed.

Mr. SCRIVEN was of opinion it was only found to exist in animals fed on brewers' grains, housed for extended periods, and milked to the last extremity.

Mr. MASON said he had asked about feeding because of the following comments appearing, under the heading of "Agricultural Notes," in the *Yorkshire Post* of that morning: "Reference may be made to the director of one of the French laboratories, who stated his belief that cows fed upon grains become diseased in a short time; that although this food conduces to the supply of a larger quantity of milk, yet that that milk is watery, by no means so nutritive, and probably productive of consumption in man, while it is certainly unwholesome. This statement seems to have excited alarm, and protests were made against it, but a well-known French investigator (Dr. Toussaint), who is quoted by the Agricultural Adviser to the Privy Council, made certain inquiries, the results of which he stated in print. One of his suggestions was that a cow which has furnished by a special course of feeding a quantity of milk in excess of what she would furnish naturally in the same length of time, produces a fluid with an abnormal secretion, and which persons of delicate stomachs cannot consume. Again, he says milk produced from cattle feeding upon grains is milk which results from an artificial kind of feeding. It is consequently artificial, and loses some of its most desirable qualities. Then he remarks that the milk of cows fed upon grains is of bad quality, and should be absolutely rejected as a food for infants of tender age, and yet brewers' grains are one of the most general of foods used by the pro-

ducer of milk for town consumption, and for two reasons—first, because it produces quantity, which the dairyman desires to obtain without much regard to quality, and next the grains can be kept for a very considerable period, and are in very many instances purchased when they are cheap, and preserved in pits for use during the winter season. We have repeatedly seen grains taken from these pits, for mixing with the food of the cattle, when they are not only extremely strong-smelling, and as objectionable as any food can be, but abominably sour and partially decomposed."

Mr. G. BOWMAN said he had no doubt the disease was infectious. It was taken into the system by ingestion. With regard to the milk, he thought it was injurious if the udder was affected in any way. It had been decided at Glasgow that no animal affected with Tuberculosis was fit for human food; but in Leeds if an animal had been affected with Tuberculosis, and the disease was localised, and the lungs not in an encysted state, the carcase had been passed as fit for food. He mentioned a case in which a butcher that week had given £17 or £18 for an apparently healthy bullock, but on being killed it was found to be affected with Tuberculosis, and the carcase was destroyed.

Mr. CARTER: Did he get any compensation?

Mr. BOWMAN: Not a shilling. Continuing, Mr. Bowman said he believed the Leeds butchers had drawn out a petition to be presented to Parliament, requesting that the disease of Tuberculosis should be ranked in the Contagious Diseases (Animals) Act, and pointing out that where beasts suffering from the disease were pronounced unfit for food, compensation should be paid the owners for the destruction of the carcase.

Mr. CLARKSON: To what extent?

Mr. BOWMAN: To the full extent.

Mr. CLARKSON: Would it not be an inducement for butchers to purchase such animals?

Mr. BOWMAN: Well, I really cannot say.

Mr. G. CARTER thought the subject so ably introduced by the President was a very serious one, and one which he considered was deserving of their earnest attention. They would benefit to a great extent in their study of the disease by all the assistance they could obtain from the sister profession. There could be no doubt that Tuberculosis was a specific disease, and it was transmitted only by the admission of the spores into the system of the animal that took it. With regard to the system of feeding and housing, animals were affected with Tuberculosis that had never been housed at all. He had found Tuberculosis affecting the mesenteric glands, and when there had been diarrhœa, and he had found tubercular Meningitis in young cattle. Those could not be taken to be produced by high feeding or milking. A medical officer of health had expressed the opinion to him that a great many children died every year from consuming milk from tubercular cows. He (Mr. Carter) asked if the officer knew of any children who had suffered from the consumption of such milk, and had recovered. The medical officer replied that he could point to two, who were now fourteen or fifteen years old, and who had never shown any further symptom of the disease. He (Mr. Carter) asked if the medical officer considered the children had suffered from the effects of Tuberculosis, did he not think they would in all probability have shown some further symptoms of the disease? and the medical officer replied that he thought they had not lived it down, but he could give no definite opinion. They were all agreed that Tuberculosis was infectious, but from that fact he did not think they had a great spread of the disease. He thought it was mostly from the hereditary taint in animals—the consumption of milk from tubercular cows by calves. He did not think the infection was spread much by the air, although he had known cases in which it undoubtedly had, but undoubtedly it was possible to be taken into the system by ingestion. In his

opinion, if the udder was not affected there was no danger in using the milk. If there were any tubercles in the mammary glands whatever he would condemn the animal, but if the animal were affected with Tuberculosis locally, in the lungs and the pleural membrane, and he found no evidence of tubercular deposits in any other part of the body, and the animal were well nourished and the flesh firm, he would say it was fit for human food. If it were possible for Phthisis to be produced in human beings by the consumption of animals affected with Tuberculosis, why, he asked, did they not find more cases of it in the human subject? Was it not a fact, he asked, that Phthisis in the human species was decreasing? Seeing the large number of animals that were affected to a slight extent with Tuberculosis and consumed for food, it looked very strange that there should not be more cases of Phthisis if it could be produced by the consumption of tubercular flesh. If there were any tubercular deposits in any part of the flesh, or the animal were poor and weak, and the flesh did not sit well, he would condemn it, but if no suppurative changes had taken place he would pass it.

The PRESIDENT referred to the difficulty of diagnosing cases of Tuberculosis, and of the danger of confounding the disease with Pleuro-pneumonia. Time after time he had been confident he had a case of Tuberculosis to deal with, and it had ultimately turned out to be Pleuro-pneumonia, and *vice versa*. He thought they would agree with him that in many cases it was impossible to diagnose whether they had a case of Pleuro-pneumonia to treat, or Tuberculosis. He did not think it was possible to differentiate with certainty.

Mr. BOWMAN described the case of an elderly man who was suffering from Tuberculosis. He had several dogs, and was in the habit of chewing meat, and then giving it to his dogs to eat. The result was that the dogs showed every indication of suffering severely from the same disease.

Mr. MASON recollected a case in which a lady suffering acutely from Consumption had occasion to frequently use a spittoon. Her dog was in the habit of licking the spittoon, and it ultimately died from Tuberculosis.

Dr. WATTS (Medical Officer of Health for Dewsbury) said he accepted the invitation of their President to attend the meeting, not to take part in the discussion, but to obtain information on the important subject of Tuberculosis. With regard to cases of Phthisis, they found it in children not fed very much on milk, but in children belonging to the lower classes, brought up anyhow. He did not say that impure milk from diseased animals would not produce it, but he thought they should not load the cow with too much blame. The question of dealing with the flesh of animals was an important one, and the subject was getting more important because such cases were continually cropping up, and they should have some definite system to work on. When the tubercule was encysted he took it that the disease was in a dormant state, but the disease must still exist in the animal, and the question was whether the animal should be condemned at that time. Unfortunately, perhaps, as a medical officer of health, he was in the particular position which they seemed to deprecate so much.

Mr. PICKERING thought with regard to the infectious nature of the disease there must at first exist a susceptibility in the subject to the disease, and with regard to the hereditary taint susceptibility must exist as well as defective sanitary arrangements if the disease progressed. With regard to the injurious effect of consuming the flesh or milk of animals suffering from Tuberculosis, he thought it depended greatly upon the quantity of the milk or food taken. Along with the affected meat or milk there were large quantities of other food taken, and might it not be, he asked, that the one counteracted the possible ill effects of the other? He might say that the conclusion arrived at by the York medical profession was that Tuberculosis ought to be included

in the Contagious Diseases (Animals) Act, and it was also decided that veterinary surgeons were the persons best qualified to inspect as to the sanitation, etc., of cow-sheds. He would like to ask the meeting whether they considered it was necessary the hereditary taint should exist in animals or human beings, as a condition of the subject becoming affected with Tuberculosis.

Mr. BRIGGS thought it was clear the disease of Tuberculosis might arise independent of infection, and if that was so they would never stamp the disease out if they included it under the Contagious Diseases (Animals) Act. They were, perhaps, apt to think that it was the animals affected with Tuberculosis that went into the market, but he maintained that it was not so. It was hard lines, no doubt, for the butcher who gave £17, or £18, or £20 for a beast, and who ultimately had it condemned on account of its suffering from Tuberculosis, but he did not see how the difficulty was to be met by the Contagious Diseases (Animals) Act, until it was proved that it was due to contagion and contagion only. He did not know what their opinion was, but he was under the impression that the disease would accrue from bad surroundings, bad ventilation in a mistal. It might be only hastening on a complaint latent in the system, but as to that they could not say. He agreed that it was difficult and almost impossible to diagnose some cases of Tuberculosis and Pleuro-pneumonia, though he never saw the temperature above 103 degrees in cases of Tuberculosis yet. With regard to the carcases of animals suffering from Tuberculosis, he said he would condemn all such animals, however slightly they were affected with the disease. It did not follow that because a parasite settled on the lungs the whole carcase was not affected, and all such carcases should be burnt, being certainly unfit for food.

Mr. GREENHALGH pointed out that a large proportion of the animals slaughtered—at Leeds at any rate—were affected with Tuberculosis to a greater or less extent, and if they condemned all of them it would be not only a very serious thing for the seller and buyer, but also for the consumer.

On the motion of Mr. BRIGGS, seconded by Mr. SCRIVEN, a hearty vote of thanks was accorded to the President for the able manner in which he had brought the subject before the Association, and the proceedings terminated.

W. F. GREENHALGH, *Hon. Sec.*

SCOTTISH VETERINARY MEDICAL ASSOCIATION.

Tuberculosis in Animals.

AT the last meeting of the above association held in the London Hotel, Edinburgh, Mr. C. Cunningham, president, in the chair, consideration was taken of a motion by Professor W. C. Williams, that the society, thoroughly believing that Tuberculosis was a contagious disease, should urge upon Government to stop the sale of milk from animals suspected of being infected, to suppress the consumption of meat from tubercular animals, and to give compensation for animals slaughtered.

A discussion ensued, in which the secretary, Mr. RUTHERFORD, said they would require to be satisfied that Tuberculosis was hurtful both to their herds and to mankind.

Mr. POTTIE, Paisley, asked if they could stamp out an hereditary disease. He denied that Tuberculosis was a contagious disease, because his experience was that the cases were isolated. It would cost Renfrewshire about £1,000 a year if Tuberculosis were placed under the Contagious Diseases Acts.

Mr. ANDERSON, Glasgow, said he was inspector for the Glasgow district of Lanarkshire, and in and around Glasgow he believed that 25 per cent. of the cows were infected with Tuberculosis. He strongly recommended that Government should introduce the disease into the Acts, to prevent its spread among cattle.

Mr. ROBINSON, Greenock, cited the case of a cow which he knew to be so badly tuberculosed that he ordered her milk to be destroyed. A servant thought it would be a sin to throw away the milk, and she fed a calf upon it, with the result that the calf died, the worst specimen of Tuberculosis he had ever seen. In that case the disease was not derived from heredity. In 1874 the magistrates of Greenock gave him *carte banche*, and since then not an ounce of tuberculosed meat had been eaten in Greenock, unless it were smuggled in. In the same time they had reduced the death-rate of the community from 18 to 13·02 per 1,000 per annum.

After a long discussion, Professor WILLIAMS agreed to modify his resolution to a recommendation to Government to place Tuberculosis under the Acts, and to condemn the use of the milk of all tuberculosed animals, and the flesh of all animals badly tuberculosed, but to allow the flesh of animals only locally affected to be used: and this was adopted.

ROYAL COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the above Association was held at the "Crown and Thistle Hotel," Abingdon, on Friday, 26th July last, G. A. Drewe, Esq., President of the Association, in the chair. There were also nineteen members and three visitors present. Messrs. A. L. Butters (Paddington), J. S. Hurndall (Blackheath), G. Rees (Staines), and W. Western (Bracknell), were unanimously elected members of the Association.

A communication was read from Mr. Dudgeon, Hon Sec., North of England V.M.A., calling attention to the fact that the meetings of that and the Royal Counties Association clashed, and stating that they would be willing to alter the date of their November meeting if the Royal Counties would alter the date of their February meeting. During the discussion of this subject, which was favourably received, it was stated that a number of Associations had no fixed dates for holding their meetings. Sir H. SIMPSON proposed that further consideration be postponed till next meeting, and that the Secretary be requested to communicate with the Secretaries of the different Associations, in order to arrange a conference to determine whether it is not possible to have dates fixed by mutual consent for their meetings. Mr. BARFORD seconded this motion, which was unanimously agreed to.

Mr. SIMPSON (Maidenhead) moved that in the event of a subscription being started for the purpose of placing a bronze bust of the late Professor Robertson in the Council Room of the Royal College of Veterinary Surgeons, a sum of not less than £5 (Five) be sent from the funds of this Association. This was unanimously agreed to.

Mr. H. J. WILSON (Newbury) submitted specimens of a diseased liver which weighed 9½ lbs. taken from a Jersey calf, nine weeks old. Also a diseased tongue taken from a yearling steer. Professor WILLIAMS said the liver was a very peculiar specimen, and one rarely met with. He believed the disease was caused in young animals by irritation set up by the remains of the umbilical cord. The tongue produced gave evidence of Actinomycosis.

It was decided to hold the next meeting in London, on the last Friday in November.

INFLAMMATION AS A REPARATIVE PROCESS.

Professor WILLIAMS gave an able address on this subject, which, he said,

was a very important one to the profession. It was stated at the National Meeting that some men worked with their hands and eyes, and some with a brass tube and a piece of glass; but although some had never possessed the tube and glass, or in other words, a microscope, that instrument was as essential to the veterinary profession as the practitioner who confined his attention to the sick box or phial. He (the speaker) had worked with the brass tube and piece of glass for the last thirty years, and he would endeavour to lay before them some of the results, the observations of himself and of many other workers, as to the changes which took place when an irritant was applied to a part. Broadly, they might define it the nutrition of the part which had been or was being acted upon by an irritant, and he might remind them that if the part were not to inflame when the irritant was applied it would be in a perverted or abnormal condition. The speaker then explained what reparative material was essential for the healing of a wound. As a result of the excitement and fever attending a wound, a large number of white corpuscles were produced by the lymphatic glands, and were formed in increased numbers when the body was under the action of an irritant. Hence this increased activity of the lymphatic system was looked upon as a curative one. Red corpuscles were produced from the white cells by ejection of so-called blood-plates. These blood-plates were colourless, and were about half the size of the red cells, being about one eight-thousand-six-hundredth part in a horse, and one six-thousand-four-hundredth part in a man. When escaped from the vessels they behaved like the white cells, forming lumps of coagula. The plates were very numerous in wasting diseases, as their development into red cells was arrested through want of strength in the patient. To return to white corpuscles, when an irritant was applied they acquired the power of migration. They wriggled through the wall of the vessel, and collected in great numbers at the seat of the irritation. They only acquired this power on being irritated, and the migration gave rise to new growths and the formation of pus. It was a well-known fact that when a part was irritated, the ordinary microbes of the atmosphere commenced to play upon that part. The lower forms of life commenced to play upon any part of the body in which the vitality had been lowered. They were the enemies; the strife went on, and it was a case of the survival of the fittest. Then the white corpuscles escaped through the walls of the vessels, and, as observed by one writer on the subject, a royal battle took place between the two. The white corpuscles were there as the army of defence. A mild irritant increased the power of the white cells to resist intrusion from without, and of destroying disease-germs. If, however, the irritant or the germ appeared in great strength, the corpuscles died in defence and carried the irritant generally away, as in pus, abscesses, granulations, etc. Without irritation of some kind there could be no healing of wounds, or new tissue-growth. To the observant men, it had been a matter of great wonder why certain diseases were so fatal. Take, for instance, inflammation of the bowels in a horse. The animal would die in a few hours. The pain did not do it, for other diseases were as painful. The reason was that in such cases the contents of the bowels were in a state of putrefaction, and the germs, gaining access to the circulation, destroyed the vitality of the blood, and death resulted from blood-poisoning more than anything else. Coagulation was also necessary for the process of repair, and blood only coagulated after the irritation and injury of the white corpuscles. Syme, one of the greatest surgeons in Scotland, came to a very practical conclusion upon this point. Syme said that when a part was wounded there was a thin discharge from the wound at first, afterwards it became "glazed." That was simply coagulation, and Syme was of opinion—and he (the speaker) thought his conclusion perfectly correct—that the lips of a wound should not be brought

together until this "glazing" had taken place. He would point out that greasy matter prevented this coagulation and process of repair. Coagulation was a proof that the blood was living and was not dead. It was concluded that coagulation resulted from metabolic change in the white cells after irritation; hence, some irritants, by inducing this change, might cause coagulation in the blood-vessels, as in pink-eye and pleuro-pneumonia. The speaker, after recommending soothing agents in acute cases, and irritants in indolent ulcers, went on to observe that the apparently destructive process on articular surfaces of joints was in reality a reparative one, as it removed the barriers to complete repair. Under the influence of slight irritation simple hyperplasia of cellular elements was observed, *i.e.*, old cells gave origin to new cells which preserved the character of their progenitors. If the irritation was more intense the old tissue was destroyed and transformed into embryonic tissue. There was then no longer hyperplasia but inflammatory heteroplasia—that was to say, the formation of a tissue which might be foreign to the part, viz., granulation tissue, which was always the same, whether the tissue from which it sprang were skin, bone, synovial membrane, etc. An inflammatory new formation was formed as follows:—Hypertrophy of the cell-nucleus, division of the nucleus, increase and then division of protoplasm, destruction of the fibres or the ground substance, formation of embryonic tissue, formation of new vessels, and cicatrisation. He pointed out that degeneration might occur when the embryonic tissue proliferates with great activity, and cells multiplied and accumulated without simultaneous formation of new blood-vessels. If the formation of the cells was rapid, many of them would never be fully developed. That which was done in a hurry was never done well.

The process of granulation was next described by the speaker. In about forty-eight hours after the infliction of an injury, such as a wound, lacerated or divided tissues would be seen in a state of disintegration, and shortly afterwards they began to separate from those which were still living. The most superficial (or in the case of a deeply-seated inflammation, the nearest) capillaries at the same time underwent a remarkable alteration. They were converted into huge sac-like cavities filled to distension with blood. Every small capillary became a prominent object from the excess of blood which it contained, and in a short time became tortuous, and had a tendency to bulge upwards, or rather outwards, on a free surface. In a few days afterwards it would be seen that these same vessels had projected still further outwards, and were recognised as granulation loops. Round about them was a dense layer of white corpuscles, and the whole process seemed to be one of distension and displacement of the capillary vessels in the part. As the vessels were thrown upwards, they carried with them a little areolar tissue which became œdematous and constituted the stroma of the granulations. The process by which this growth of new vessels was carried on was as follows:—The capillaries were formed of nucleated and endothelial cells cemented together at their edges. When irritated, these cells swell and soften, and if the inflammation continued, their nuclei multiplied and the vessels of the inflamed tissue returned to the embryonic condition, *i.e.*, they were formed of embryonic cells arranged in rows and having in their centre a canal through which the blood circulated; and these modified capillaries and small blood-vessels became the point of departure for new vessels in various ways. Sometimes the cells themselves had anastomosing canalicular processes which put them in relation to the old vessels, after which they enlarged so as to receive the blood-corpuscles. In cases—a wounded foot, for example—where there was exuberant granulation, torture was sometimes caused by the application of caustic. That was a mistake; the real remedy was in a soothing application. An exposed wound would heal without granulation, provided the super-

ficial vessels were kept in their places by accurately applied pressure, and excessive congestion prevented by the wound being kept from putrefaction. In this case the wound became covered with a pellicle of new tissue elements, and the epithelium spread over the surface without there being any more vascularity than was necessary for organisation. Granulations, perhaps at first exuberant, always contracted, and this was not merely a process of drying, but an atrophy brought about by a layer of cicatrix-like elements, mostly spindle-shaped cells. As the stems of the granulations projected towards the surface they had to pierce this layer, which during the process of repair began to contract, and in so doing constricted the capillary stems of the granulations, thus bringing about a natural atrophy. The further development of reparative material was well illustrated by the experimental organisation of porous dead materials, such as a piece of sponge, silk ligatures, dead pieces of tissue (as lung, liver, cornea), balls of worsted, etc. If they took a small piece of sponge, and placed it, with antiseptic precautions, in the peritoneal cavity of an animal, it need not excite general peritonitis. It usually became attached to a coil of intestine within a few days, and in ten days would be found to have become firmly attached to the peritoneal coat of the bowel. If cut into, a layer of organising tissue from one-eighth to one-tenth of an inch deep would be seen by this time to have penetrated its substance. The manner in which organisation was accomplished was as follows:—The first thing noticed was that the interstices of the sponge became infiltrated with blood-stained fibrinous lymph. The sponge-canals did not usually become obstructed by it, but a fibrinous network was found adhering to their walls, with many white blood-cells entangled in it. In course of time, however, this fibrinous layer gives way to the invasion of cells, both spindle-shaped and round, called by some writers true fibro-blasts. These gradually and progressively pushed their way inwards into the sponge, destroying or supplanting the fibrinous lymph. At the point where the two met the fibrine could be seen falling to pieces, becoming absorbed, and in all probability the new cells lived upon it—in fact, ate it up. According to one view, the leucocytes were consumed along with the fibrine, and took no part in the organisation, being succeeded by larger cells, originating in the pre-existing tissue, large and round whilst young, but rapidly tending to become converted into spindles. Other observers and writers, however, thought that the white cells, leucocytes, still played an important part, and that in reality they formed the whole of the reparative process, eating up the *débris* of the exudation, swelling into large cells, becoming spindle-shaped, and finally formed into tissue. This was not his own opinion. Then came the more practical observation—how were they to guide this process? Were they to encourage it? They would take a case of inflammation of the lungs. There the reparative process of itself, if excessive, might become fatal to life by destroying the vitality of such an organ as the lung. Hence this irritation, if extreme, proved destructive. In that case they might diminish the irritation, and that was the great object in the treatment of inflammation—to recognise the due amount of the irritation of the body generally, and endeavour to maintain the body in that peculiar condition. If it was extreme, the function and vitality of the part were destroyed. They could therefore diminish that risk by reducing the irritation of the part and confining the reparative process within reasonable limits. Hence their great object should be to recognise the normal state of the body, moderate any undue irritation, and allow the process of repair to go on mildly and naturally.

On the motion of Sir HENRY SIMPSON, a hearty vote of thanks was given to Professor Williams for his excellent address.

A cordial vote of thanks was also given to the President.

The members and visitors then adjourned for refreshments, and the interesting gathering shortly afterwards terminated.

H. KIDD, *Hon. Sec.*

BORDER COUNTIES VETERINARY MEDICAL SOCIETY.

A GENERAL MEETING of the above Society was held at the Bush Hotel, Carlisle, on 26th July, 1889. Present:—Mr. Jos. Donald, F.R.C.V.S. (President); Professors McCall, Glasgow; Walley, Edinburgh; Dr. Limont, Glasgow; Messrs. Robson, Penrith; J. J. Bell, Bell, Jun, and Carlisle, of Carlisle; Faulder, Cockermouth; Thompson, Aspatria (Treasurer); Hoadley, Middlesboro'; Little, Abbeytown; Croudace, Haltwistle; Young, Cockermouth; Coates, Brampton; Dawson, Carlisle; Greaves, Manchester; Troughear, High Hesket; Carruthers, Brampton; Steel, Wigton; Armstrong, Penrith (Secretary).

Mr. Steel, of Wigton, was elected a member of the Society.

It was decided that a new and complete book of rules be printed, and circulated amongst the members.

Professor MCCALL read the following paper:—

TUBERCULOSIS, AND THE DISPOSAL OF THE BODY OF ITS VICTIMS.

GENTLEMEN,—Having been informed by your Secretary that Tuberculosis had not as yet been introduced as a subject of discussion by the members of the "Border Counties Veterinary Medical Society," I thought it might be acceptable to you that I should do so.

It is a subject in which every individual is deeply interested; and upon how the flesh and milk of tuberculous cattle are dealt with, the health of the community undoubtedly, and to a marked extent, depends.

The public, by writings and legal prosecutions, have at last been awakened to the gravity of the position in which they are placed, and they will insist upon a sweeping reform in all that appertains to the inspection of live animals in dairies, and the slaughter and disposal of their bodies, as food for man.

In the work of awakening, I am glad to say that many of the members of the veterinary profession have taken a prominent part, and the same may be said of many of our medical brethren; but in both professions there are a far greater number who have either stood aloof, or taken up a position of antagonism. That there should be members of both professions who are not convinced of the evil effects of drinking the milk and eating the flesh of tuberculous animals, in certain conditions, I for one, do not feel surprised; and still less do I ascribe their unbelief to a thoughtless ignorance, or a wilful desire to pervert facts!

To those who have not had many opportunities of studying Tuberculosis in living animals and making after-death examinations of their bodies, or it may be have not put themselves to the trouble of thinking much about the malady, it is a simple matter to subscribe to the now-current views; but to those who have had such opportunities, difficulties arise which they cannot comprehend, nor can they obtain a clear comprehension by a reference to that which has been written on the subject by others.

With the earnest desire to assist others in their difficulties, and in giving expression to them, and to strengthen and correct my own views by the discussion which I hope will follow the reading of this paper, I shall discard all technicalities and treat the subject from what I consider might be called an every-day practitioner's point of view.

As no doubt most of my audience are familiar with the life-history of Tuberculosis, I shall only refer in passing to one or two points in connection therewith.

In the year 1865, Villemin made the important announcement that he had, by *inoculation*, transmitted the disease from man to animals, and also from animals to animals, thus proving beyond doubt that Tuberculosis was not only an inoculable malady, but a malady transmissible from man to animals; and I need only say that if Villemin had dared, he would at the same time have proved, by similar experiments, its transmission by inoculation from animals to man.

On reading the record of his experiments, I remember—and no doubt so do many others—the profound impression they produced on my mind, and from that hour to this I have felt convinced that Tuberculosis was an intercommunicable disease, and consequently that the carcases of cattle *markedly affected* with the malady ought not to be used as human food.

Villemin's announcement was made in the same year that "Rinderpest" appeared in this country, viz., 1865, and as during the continuance of that disease, I had in Glasgow the supervision and inspection of all carcases as to their fitness for human food, ample opportunities were afforded me of studying the various forms which bovine Tuberculosis assumes, and the structural changes which it produces in its course.

It had been the custom in Scotland, as far as known to me, to pass as fit for human food the carcases of all animals affected with Tuberculosis, *no matter how markedly so*, if the flesh appeared good; but for reasons which will be referred to hereafter, I felt constrained to adopt a different course, and accordingly condemned them. In July, 1866, in consequence of the condemnation by me of a large fat cow affected with Tubercular Peritonitis and abscesses in the mesenteric glands, and the refusal of the owner to acquiesce in the decision, legal proceedings were instituted much on the same lines as in the recent prosecution in Glasgow, and with a similar result, viz., condemnation by the Court of the carcase and its confiscation. After this decision, the carcases of all animals whose glands testified to the presence of tubercular deposits were confiscated, and this confiscation continued as long as I continued to act as Inspector of butchers' meat in the slaughter-houses of Glasgow.

I enter thus fully into these facts because they are not generally known, and because not a few individuals think that the legal proceedings in the recent trial were taken by the authorities of Glasgow without consideration, and only on account of the reports which have recently been issued by the Privy Council's Departmental Committee, and by the Paris Congress; and further, I refer thus pointedly because it has been made to appear as if the first proceedings in Scotland, as regards the condemnation of carcases affected with Tuberculosis, emanated from Greenock in the year 1874, whereas it was from Glasgow in the year 1866.

But to proceed; in the year 1868, Chauveau, after the performance of a series of most interesting experiments, proclaimed the fact that Tuberculosis was not only an inoculable disease as announced by Villemin, but that it also could be induced by *ingestion, i.e.*, feeding sound animals on tubercular products. Up to this time it was the almost universal opinion of the profession, that the gastric and other secretions were sufficient to destroy all living animal or vegetable organisms or poisons gaining an entrance to the body through the stomach and in the food.

Again, in the year 1881, Toussaint announced an important discovery which he had made, viz., that the organisms of Tuberculosis could be cultivated or grown outside the body of the animal, and following this up in the year 1882, Koch proclaimed that he had succeeded in separating and staining

by a special process *the organism* on which the disease depended, viz., the "Bacillus Tuberculosis."

Such may be said to be the faintest outline of the history of Tuberculosis.

Since the year 1868 to the present time, innumerable experiments have been undertaken in all countries to test the accuracy or otherwise, of Villemin, Chauveau, Toussaint and Koch's experiments and conclusions, but in the main they remain unaffected.

While admitting the accuracy and vital importance of the experiments referred to, it would probably not be far short of the truth to say that until lately the bulk of the medical and veterinary professions entertained the opinion that the Tuberculosis of the human family and the lower animals were distinct diseases, and therefore not much harm could accrue from using the flesh of tuberculous cattle as food for man.

Much was made, and is still attempted to be made, of the microscopic differences of human and bovine tubercular eruptions and their bacilli, but while admiting that there are marked differences, yet these differences are clearly of little essential importance, for innumerable experiments have proven that "tuberculous matter derived from man will produce pulmonary Phthisis, and this inoculated Phthisis can be transmitted by inoculation to other animals." The microscopic differences in the growth of the organism and the cell structures in which it is embedded or surrounded, probably, as has been suggested, are due to the differences in soil and environments, but whether or not, the result of experimental proof goes to show that human and bovine Tuberculosis are one and the same disease, and that the disease is essentially a parasitic malady.

Vegetable organisms, as is well known to all, will only grow in certain climates at certain altitudes; in other words, they can only live under certain definite conditions, and undoubtedly the organism of Tuberculosis may by inoculation be grafted on the body of many warm-blooded animals, but it can only live in a vigorous condition in the bodies of a few.

Those of us who require to make numerous *post-mortem* examinations of the bodies of the lower animals, have found tubercular deposits frequently in the bodies of all of them; but unless under direct experimental propagation, few of the various species of the lower animals exhibit marked symptoms of the malady during life, and more rarely still do they succumb to the affection.

True it is that Tuberculosis is a prevalent and deadly malady in the human subject, and also in bovines; but in horses, sheep, pigs, cats, and dogs, it is not so. From what I have observed, I incline to the opinion that the *Bacillus Tuberculosis* is an organism wide-spread in nature, that probably it gains an entrance into the bodies of most animals, but that it cannot reproduce itself and produce destructive effects in a perfectly healthy body when introduced by what I would call the natural method of propagation of the malady, viz., inhalation.

It certainly does appear that the human and bovine body furnish the most congenial soil of all animal bodies for this organism to breed in; but the fact that medical men and nurses live in attendance on consumptive patients in consumption hospitals for years and remain unaffected, proves that the healthy human body is not a fit soil for the tubercular organism to breed in, even when inhaled for weeks, months, and years.

Should, however, the medical advisers or the nurses contract a chest affection—especially a broncho-pneumonia—then their chances of escape, unless by an early withdrawal, are limited. Experience would lead me to speak in like terms of the spread of Tuberculosis in cattle by inhalation.

Tuberculosis spreads with greater rapidity in a herd of cattle than it does in a family of individuals, and at the first glance it would therefore appear that

it was a more infectious malady in cattle than in men; but I apprehend that its rapidity and malignance is more dependent on *ingestion* than *inhalation*, or rather I should state it, that both methods of propagation are in operation in its spread among cattle. Cattle have no qualms about eating each other's food, in fact, if they get a chance they will, and as *ingestion* is as certain and almost as rapid a method of propagating Tuberculosis as *inoculation*, we can understand how it is that Tuberculosis runs a more rapid course in cattle than in mankind.

It is not necessary that the mucous membrane of the stomach or intestines should be in a diseased state in order to ensure the absorption of the tubercular virus by ingestion, but I incline to the opinion that it may be necessary in order to its reception by inhalation.

In the discharge of my professional duties, I have known as many as twelve cows die of Tuberculosis within twelve months, and that out of a herd only numbering twenty-four.

As already stated, in our *post-mortem* examinations we frequently find tubercles, one or more in number, in various organs, and this, too, in all our domestic animals, and from their calcified and other changed conditions, it is evident that they have been there for a length of time. Now leaving out of sight for the present the affection in cattle, and directing our attention to what we have observed in this disease as it affects other animals, it is not only evident that these tubercles were of old standing, but that they never seriously affected either the organs in which they were situated or the general constitution. The animals were in apparent health and feeding well, it might be up to the day of their death, and it was evident that the cause of death had no connection with the presence of tubercles. There they were, however, and we were forced to admit that to all appearances they had done no harm.

Now if I am correct in my interpretation, it can only be because the bacilli had died out, or been destroyed by leucocytes or other cells or organisms more powerful than themselves. These tubercles, I repeat, we find inhabiting the bodies of all animals, and as it is generally believed that tubercles are an evidence of the pre-existence and operations of tubercular bacilli, then undoubtedly Tuberculosis is a wide-spread malady, but it does not tend to a fatal issue in a large number of the different species of our domesticated animals.

It is a point I wish particularly to emphasise, that while a considerable percentage of most animals show evidences on *post-mortem* inspection of having at some time in their life harboured the *bacillus tuberculosis*, in most of them, by the death or destruction of the organism, a fatal issue is avoided; and thus it may be said in them to be a curable disease. Turning now our attention to Tuberculosis in the human subject and in cattle, in general terms it may be said that it is in both a fatal malady. Acute or generalised Tuberculosis in all animals, in my experience, has terminated fatally. Given a case of tubercular Pleuritis, or tubercular Peritonitis, and there can, I believe, be but one termination, and that in death, and probably within six weeks, or at most three months.

But while freely admitting all this, I am of the opinion—an opinion founded on the many *post-mortem* examinations I have made—that Tuberculosis is a frequently arrested malady in cattle, as well as in other animals. Just as in horses and sheep, so in cattle, I have over and over again found a few tubercles in the lungs and liver, some calcified, but many not; the time apparently being too short, and not one speck of diseased structure elsewhere; and such being the case, I entertain the opinion that by a similar process the organisms have been annihilated in the body of the ox, as in that of the horse and other animals, and when such is the condition I am of the

decided opinion that the carcases of such cattle are fit for, and should be allowed to be sold as, human food.

In the condition of which I speak, the disease has apparently become localised.

Some pathologists do not believe in a local tubercular process, and while it may be defined, it cannot be proved with certainty by any method of examination of that body after death. What I mean is this—given a body showing a few tubercles in a fibroid, shrivelled, or calcified condition, and to all appearance the disease local and arrested; still, as a fact, we do not know that it is so, because it is possible that bacilli still inhabit that body. But while admitting all this, I still incline to the opinion that Tuberculosis is frequently a local disease. If it were not so, the excision of tubercular, or more frequently termed scrofulous joints, the scooping out of the interior of tuberculous bones, and the removal of tubercular glands, now so frequently performed on the human subject, would be of no avail; and we all know that in a large number of cases it is a success, and individuals so operated on have lived for years thereafter, and ultimately died without presenting a symptom of lung or bowel consumption.

It is, I admit, a serious position to advise the profession to take up, viz., that the carcases of cattle in whose organs fibroid or calcified tubercles may be found are notwithstanding fit for human consumption, and should be allowed to be sold for that purpose; but I must be allowed to hedge the privilege of sale around, and to the extent which I consider, comparatively speaking, safe to those who eat the flesh.

In the first place, upon whose shoulders is the grave responsibility of passing or condemning flesh food to rest? It is a responsibility involving an enormous amount of the nation's pecuniary means on the one hand, and the nation's wealth and strength on the other. To an impartial and unprejudiced mind, I apprehend the duties of the office fall as it were by inheritance to be discharged by the members of the veterinary profession; but I would advise no veterinarian to offer his services, or local authority to accept of them, who had not specially prepared himself for the efficient discharge of the duties.

To speak of policemen, butchers, or any other body of non-professional men, discharging the duties efficiently, is utter nonsense. Such persons may be made valuable assistants in the labour, but to depute to them the disposal of carcases is an act of cruel injustice to the proprietors of our herds and flocks, and to the public who consume their flesh.

Having placed at the head of affairs a duly qualified and properly trained veterinarian, we now proceed to deal with the disposal of the carcases; and firstly, *condition of body* should be set aside, and not, as at present, made as it were the pivot on which all judgment and action proceeds.

Given a case, for example, of acute tubercular Pleuritis or tubercular Peritonitis just commencing, and in the primest fat ox, in my opinion every part of the carcase should be condemned, and with as little hesitation as in the case of a lean emaciated beast. We order condemnation, because we believe that this form of Pleurisy or Peritonitis—which an expert can recognise with his naked eye—is dependent on the irritation set up by the presence of the bacilli in these great lymph sacks. We believe that they are there in their thousands, and if only a short time be given they would destroy life.

It has been attempted to be shown that we cannot, with the naked eye, distinguish between simple acute Pleurisy and acute tubercular Pleurisy; but those who have studied the subject find no difficulty in doing so, and even were it the case that a single bacillus could not be found under the microscope, we would not hesitate in maintaining our diagnosis. But bacilli are there, and if care and knowledge be brought to bear in their detection they will always be found—at least, such has been our experience.

The animal, we repeat, while living, may have appeared in the best of health, and been sold by the breeder and bought by the butcher as a typical representative of a prime fat ox or cow, and still when slaughtered, we order the condemnation of the carcase. Because even in the earliest stage of acute tubercular Pleuritis or Peritonitis, if the tubercular exudate be inoculated on, or ingested by, a sound animal it will fall a victim to general Tuberculosis; and further, because the fat, but affected animal itself, if allowed to live, would become emaciated, and also die a victim to Tuberculosis.

Some parties apparently believe that the disease can only be a local affection as yet, seeing the carcase is in such prime condition, and they consider that those who are to eat the flesh are sufficiently protected by the removal of the pleural and peritoneal membranes on which the tubercular exudate has been poured out; but may not the bacilli and their spores be circulating in the lymphatics and blood-vessels which communicate with the pleural and peritoneal cavities?

That they are not, those who say so, and it may be, believe so, have no proof to offer; but that they are circulating, those of us who believe so have proof to offer in the fact that tubercles have been found growing in the walls of the blood-vessels and lymphatics, and even in the medulla of the bones.

Professors Klein and Lingard "have found that in Tuberculosis artificially produced by subcutaneous inoculation in guinea-pigs, one of the earliest tissues containing tubercles and the tubercle-bacilli, is the marrow of bones;" and I have found tubercle and tubercle-bacilli in the marrow of the bones and in the muscular tissue of a fine prime fat ox.

By what channels can the bacilli or their spores, from a point of inoculation locally situated, reach the marrow of bones, the lungs, the covering of the brain, the bowels, and other tissues? By no other channels at present known to us, except the blood channels and in the blood stream. Upon this all-important point allow me to quote a passage or two from Professor Klein:—"This conclusion at once disposes of the assumption occasionally made, that if in an animal the lungs and thoracic lymph glands are the only organs visibly affected with tubercle, the removal of these viscera is sufficient to insure the safety of the rest of the animal's body, as far as its usefulness for consumption is concerned. Though we may not by naked-eye inspection, or even by microscopic examination be able to detect the tubercle bacilli in the muscle or connective tissue, how can we be justified in excluding their presence from the circulating blood, including the blood in the vessels of the muscles and connective tissue? What would be our reasons for saying that at the time of killing the animal the tubercular virus is not circulating in the blood and is not in transit to distant localities, say—to the marrow of the bones or other tissues destined in the natural course of things to become the seat of tubercular deposit? It must be clear from these considerations that no part of an animal in which even a single organ is visibly affected with tubercle, can be held free of the tubercular virus."

Now that attention has been particularly directed to the circulation of the bacilli, I have no doubt that tubercles will be found frequently in the marrow of the bones and in the lymphatics of fat and apparently healthy subjects prior to slaughter. Bodily condition, fatness or leanness, I repeat, should not in the least influence the inspector's opinion in disposing of the carcase of an animal affected with acute or generalised Tuberculosis.

We would also consider and condemn as unfit for human food, any carcase, irrespective of condition, in which the tuberculardeposit was found to have invaded rather extensively any organ, and although to all appearances, the disease was localised. I quite agree with Professor Klein in the view "that no part of an animal in which even a single organ is visibly affected with tubercle, can be held free of the tubercular virus and free from danger to the

consumer." It is self-evident that perfect safety can only be ensured by destruction of all carcases tainted with the disease, but I am scarcely prepared for such a sweeping reform, nor do I believe such a measure will be generally enforced.

Under the conditions I have stated, the public would be prevented eating the flesh of tuberculous animals to a large extent, and the stock-proprietor and dairyman, instead of, as at present, looking helplessly on and allowing his tubercular subjects to pine away from day to day, would awaken to the importance of instantly slaughtering all animals showing the slightest symptoms of the disease, and adopting a more enlightened system in the breeding, housing, feeding, and exercising of his cattle.

I do believe that Tuberculosis, especially in cows, is largely a preventable malady, and that the housing of them in close, badly-ventilated cow-sheds, the feeding of them upon brewers' grain, in order to obtain the largest amount of milk, and the absolute want of physical exertion as is the case in most town dairies, are the reasons for the extreme prevalence of Tuberculosis in cattle, as compared with all other animals.

If milch cows are kept tied up to the stake, as they are in Glasgow, from the day they enter the cow-shed to the day they are taken to the slaughter-house, need we wonder that the lungs of many of them show tubercles! The want of pure air and exercise is just as obviously the pre-disposing cause of the Tuberculosis in their case, as in that of wild animals caged up in menageries. West Highland cattle rarely present tubercles in their lungs on slaughter. Wild animals in their forest homes are all but exempt from Tuberculosis, but in menageries no disease destroys so many as Tuberculosis.

Now that Local Authorities are required to slaughter all herds in which Pleuro-pneumonia gains a footing, veterinary inspectors will have an opportunity of giving statistics of animals affected with Tuberculosis, and it will be interesting to note the wide differences in the various herds. In Glasgow dairies, as far as we have gone, it ranges from twenty to twenty-five per cent.

And now I desire to direct your attention to the question of Compensation. The principle of compensation for animals slaughtered, affected with a contagious disease, has been conceded, and is in operation, and I hold that no valid reason can be adduced why Tuberculosis should not be included in the list of scheduled diseases and the animals affected dealt with on the same lines as when affected with Pleuro-pneumonia.

The public health would be more benefitted by the slaughter and condemnation of animals affected with Tuberculosis than Pleuro-pneumonia, for I have yet to learn of any harm having arisen to the public by eating the flesh and drinking the milk of Pleuro-pneumonia cattle.

As business is at present conducted in the sale of animals for human food, the butcher is the greatest sufferer by this disease, and he is, to my mind, justified in raising every objection to the wholesale condemnation and confiscation of the carcases of the animals he has purchased, until an arrangement has been made whereby he will be reimbursed his pecuniary loss.

The victim of Tuberculosis is frequently of considerable pecuniary value, and generally it is bought at a full value and in open market. No protection has been given the butcher in making his purchase, and it is, to say the least, very hard to find that after he has paid his money and is only attempting to regain it, with interest for his labour, by the disposal of the carcase for the purpose for which it was legally purchased, that his honest earnings—and it may be his all—are swept away, and his position and character seriously imperilled.

As you are aware, the evidence laid before the Departmental Committee of the Privy Council, and the finding of that Committee, were both in favour of

the inclusion of Tuberculosis in the list of scheduled diseases, and the granting of compensation as in Pleuro-pneumonia. The findings of the Departmental Committee are so important and so clearly expressed, that they should be known to all; and in case they may have escaped the memory of some here present, I have much pleasure in making the following quotations:—

"In order to ensure the gradual extirpation of Tuberculosis, we are of opinion that it should be included in the Contagious Diseases (Animals) Acts for the purposes of certain sections of those Acts, so as to provide:—

"(*a*) For the slaughter of diseased animals when found diseased on the owners' premises.

"(*b*) For the payment of compensation for the slaughter of such animals.

"(*c*) For the seizure and slaughter of diseased animals exposed in fairs, markets, etc., and during transit.

"(*d*) For the seizure of diseased foreign animals at the place of landing in this country.

"The powers and responsibilities of inspectors in ordering the slaughter of diseased animals should be the same for Tuberculosis as for Pleuro-pneumonia.

"An additional argument in favour of the slaughter of diseased animals is to be found in the fact, that frequently Tuberculosis and Pleuro-pneumonia actually occur together, or are mistaken one for the other; so that, in either case, slaughter would be highly desirable.

"Further, tubercle though hereditary, is nevertheless much less contagious than the other diseases included under the Act of 1878, and it is clear, therefore, that the immediate slaughter of diseased animals would go far to stamp it out, though doubtless, owing to heredity, the stamping out process would be gradual in its effect.

"The annual reduction of the disease would probably be very considerable, and even should it not be so, that would not constitute any reason against the adoption of the proposed regulations, since, however small the effect produced, the result to the nation must necessarily be gain.

"As in other diseases scheduled in the Act of 1878, so in this, the owner should be compensated for the slaughter of a tuberculous animal at the rate of three-fourths of its value before it was slaughtered, and the valuer should shape his estimate according to its worth to the owner, *i.e.*, as a milk producer, or for any other special purpose."

And now, in conclusion, permit me to say that as it was only after considerable pressure had been brought to bear on the Lord President of the Council (by representations in writing and deputations from various Local Authorities headed by members of Parliament), that a Departmental Committee was appointed to consider this disease and other pressing questions, so it will only be after renewed pressure is brought to bear that the Government will adopt the recommendations of that Committee; and such being the case, the sooner the Local Authorities set about applying that pressure it will be the better, not only for all parties pecuniarily concerned, but for the nation at large.

ROYAL AGRICULTURAL SOCIETY.

THE following report was submitted at the last Council meeting:—

Quarterly Report of the Royal Veterinary College.

During the last quarter cases of various diseases of cattle, sheep, and swine have been received at the College, and it is a satisfactory outcome of the attempt which is being made to advance the practice of veterinary medicine

in relation to animals of the farm that at one time the accommodation which is at present available for these animals was overtaxed.

The diseases which have been under observation at the College are abortion in cows, arsenical poisoning from the use of a fluid sold as tobacco water for destroying vermin on the skin, Anthrax in cattle, a fatal disease in sheep resembling Braxy, a fatal form of skin disease among sheep, a peculiar disease affecting the legs and feet of sheep, Tuberculosis in cattle, sheep, swine, and poultry, Blackleg in young cattle, Actinomycosis in cattle, Diarrhœa in lambs from the presense of tape worms, lung worms in calves and sheep, and Swine Fever. In compliance with the requests of members of the Society, inquiries have been made by the officers of the College in reference to outbreaks of disease in different parts of the country. The following reports will indicate the character and results of the investigations :—

Abortion among Cows.

On the 12th of April an inquiry was instituted into the circumstances relating to the long-continued prevalence of abortion in a herd of milch cows. The farm where the disease appeared comprises 327 acres, of which one-third is arable and two-thirds grass. The latter is mostly old pasture, but a small quantity has been recently laid down. The farm was entered upon at Lady Day, 1885. The former tenant kept about sixteen head of breeding stock, but during his occupation, extending over ten years, abortion was only occasionally known to occur upon it.

The soil varies in character in different parts of the farm from a strong clay to sandy loam. All is drained, and the pasture land is sound and fairly good in quality. The general surface of the farm is flat, but the drains have plenty of fall and maintain a fairly dry lair.

The general health of the herd has been good, and the cows have yielded a fair supply of milk with an average percentage of butter. With respect to the mortality, it was ascertained that in 1885 two cows were destroyed on account of Tuberculosis; in 1886 there were no deaths; in 1887 one cow died from Milk Fever; and in 1888 two others succumbed to the same malady, and one was destroyed on account of disease resulting from retention of the afterbirth.

The herd is made up of Shorthorns and Jerseys. The stock is mostly home-bred. Occasionally one or two have been bought when, in consequence of abortion, the milk supply has fallen short of the requirements of the dairy.

Since 1885 ten bulls have been at service in the herd. Some were Shorthorns, others Jerseys. Abortion has not been confined to cows served by any particular animal, nor has it occurred with greater frequency in cows served by one bull over those of another.

Inquiry as to the fertility or the herd brought out a striking coincidence in the prevalence of abortion and misconception during 1887 and 1888. In this connection it appears that in 1885 no cows returned to the bull after service. In 1886 three were unfruitful, but in 1887 no less than nine came back, and in 1888 eleven. Of the twenty-three animals here referred to it is important to note that nineteen were heifers.

It will thus be seen that abortion and infertility were co-existent, a fact which needs to be borne in mind in all future enquiries with a view to determine their casual relations.

The system of feeding and general management is much the same as that in other dairy herds. In summer the cows are at pasture both night and day, and are brought into the sheds morning and evening to be milked. Here the water supply is derived from ponds fed in some instances by springs, in others

by surface drainage. There did not appear to be any reason to question its fitness for drinking purposes.

About the middle of October the cows are housed for the winter, daily exercise being allowed when the weather is fine.

The food is made up of hay or straw chaff, 2 lb. or 3 lb. of decorticated cotton and pure linseed cake, and 4 lb. to 6 lb. of mixed meal. Long ensilage and swedes are added to the food at Christmas, and in March mangolds are replaced by sweeds. All the food ingredients are said to have been of good quality and free from any obvious contamination with unwholesome matter.

On inquiry as to the use of ensilage it was found that in 1887 and 1888 this had been given to the milch cows only. As, therefore, the malady had largely prevailed among the heifers during this time, the ensilage may be fairly dismissed from consideration as having any concern with the disorder.

It was also noticed that although cake had not been used during the present year, no less than four cases had occurred up to the time of the inspection (April 12th), thus excluding this ingredient of the food also from the possible causes of the mishap.

From time to time during the prevalence of the disease search has been made for ergot, without, however, leading to its detection in any of the pastures, and the fullest consideration of all the facts and circumstances of the inquiry fails to supply reasonable explanation of the origin of this troublesome pest.

Arsenical Poisoning.

In May an inquiry was made into a fatal disease which occurred in a number of young cattle, near St. Neots.

It appears that a number of the herd having been noticed to be infested with lice, thirty-three of them were dressed with a liquid purchased from a neighbouring chemist as "tobacco water." A short time after the application had been made one of the beasts showed signs of ill-health, several others sickened on the following day, and in a day or two all of them had become more or less affected. Of the thirty-three animals dressed nine died in the greatest of agony, exhibiting all the symptoms of arsenical poisoning.

The parts to which the dressing was applied, and especially in the region of the neck, was much swollen, and in some instances the skin was completely destroyed and in a sloughing condition. Dulness, Diarrhœa, great thirst, staggering gait, and acute abdominal pain were the leading symptoms of the disorder. *Post-mortem* examination showed the stomachs and intestines to be intensely inflamed, and chemical analysis of their contents revealed the presence of arsenic. The so-called tobacco water was also analysed and found to contain arsenic in large amount.

A Disease affecting a Flock of Sheep in Gloucestershire.

Considerable numbers of a large flock of sheep had become affected with swellings of the limbs, at first rendering the skin hot, tense, and painful as manifested by intense lameness, usually terminating in death and ulceration of large patches. Spontaneous recovery is not uncommon, and the condition is not often fatal. Frequently after healing is complete there remains a much thickened limb, which depreciates the value at sale for breeding purposes. During the progress of the malady the sheep suffers much pain and loses flesh. Medical treatment favours recovery.

The nature of this disease is obscure, and requires further study. The owner of the flock in question offers facilities for further investigation, which it is proposed to prosecute.

Suppurative Disease of the Face in Calves.

In November last a disease of a fatal character broke out in a number of calves, belonging to a farmer in Essex.

The malady was confined to animals between one and three weeks old. In all twenty were affected, and ten or twelve succumbed to the disorder.

At the time of the occurrence some of the calves were being fed on linseed cake gruel, and others were taking milk from the cows.

In the majority of cases the disease was ushered in by Diarrhœa, which continued more or less severe throughout the attack. This was shortly followed by a hard inflammatory swelling on one or both sides of the face, which ultimately broke out, and discharged a quantity of thick pus, as well as a tough mass of dead tissue, or "core."

A copious outflow of "matter" continued for two or three weeks after the rupture of the abscess, leading to great emaciation and weakness, and in the majority of cases to fatal prostration.

No *post-mortem* examinations appear to have been made, and at the time of the inspection the disease had disappeared, save in one instance, where a slight tumour still remained on the face. This animal has been secured, and will be the subject of further inquiry into the nature of the affection.

Of the origin of the disease there did not appear to be any satisfactory explanation forthcoming, but inquiry brought to light the fact that all the calves affected were by one bull, and that for some time he had suffered from a discharge from the urethra.

More recently he was destroyed, and from the condition of the lungs, as described by the owner, there is every reason to think he was the subject of advanced pulmonary Tuberculosis.

Symptomatic Anthrax.

On the same farm an outbreak of symptomatic Anthrax occurred in a herd of thirty-six heifers and steers, varying from six months to three years old. The disease commenced on July 12th, and by the 18th, when the inspection was made, six animals had already died.

The first animal attacked was destroyed early in the course of the disease, when it was thought to have been struck by lightning, and the blood was allowed to remain exposed in an adjoining pasture, but whether this in any way added to the extension of the malady it is difficult to say.

The affection had not previously been known to prevail on the place, and no recent addition had been made to the herd.

At the time of the outbreak the beasts were pastured on land adjoining the River Stort, from which they received their supply of water. The pastures are low-lying, and exposed to occasional flooding.

In the spring of the present year they were, for the first time during the present occupation, dressed with London manure, but in other respects nothing exceptional had occurred in their management.

Notwithstanding a careful inquiry into all circumstances of the disease, no clue was obtained as to the source of the contagion.

Such measures of prevention as the nature of the case demanded were suggested, and material was procured from recently dead animals to carry on the experiments now being conducted at the Royal Veterinary College.

The expenses attending these inquiries were defrayed out of the annual grant made to the Royal Veterinary College.

The experiments which have been carried on for the purpose of ascertaining the best means of protecting cattle from Blackleg are not yet sufficiently advanced to justify any positive conclusion. But the results which have been obtained have an important bearing on the question of protective inoculation.

Army Veterinary Department.

Gazette, July 26th.

FIRST AYRSHIRE AND GALLOWAY ARTILLERY.—Thomas Anderson Douglas, gentleman, to be Veterinary Surgeon.

Second Lieutenant Beech, C.M.G., 21st Hussars, attached to the Egyptian Army, and late of the Army Veterinary Department, commanded the Egyptian cavalry in the engagement with the Dervishes at Toski recently, and was especially commended by the Sirdar, General Greenfell, for his services, which materially contributed to the complete victory achieved on that occasion.

Obituary.

THE following deaths have been announced:—

R. Whitewell, M.R.C.V.S., Dorrington, near Shrewsbury, graduated 1841
Wm. Murch, M.R.C.V.S., London „ 1862

Notes and News.

ANTHRAX IN DEER.—Lord Bristol's herd of deer at Ickworth Park, Bury St. Edmund's, has been attacked by Anthrax. Nearly two hundred animals, principally does and fawns, have died. The mortality is decreasing slowly.

STUTTGART VETERINARY SCHOOL.—The students of the Stuttgart Veterinary School have unanimously resolved not to attend it next winter, because the expectation that it would be raised to the rank of an Academy or University (Hochschule), on the occaslon of the recent celebration of the twenty-fifth anniversary of the King of Wurtemberg's accession to the throne, has not been realised.

THE SPEED OF AMERICAN TROTTING-HORSES.—The *New York Herald*, writing upon the development of the American trotting-horse, recalls the "record breaking" of the last twenty-five years. When the war closed only one trotter had ever made a mile in less than 2 min. 20 sec. Flora Temple's Kalamazoo performance in 1859 was the wonder of the world. Yet the record which gave her fame—2 min. 19¾ sec.—has now become commonplace. It was reduced to 2 min. 17¼ sec. by Dexter in 1867. Goldsmith Maid first lowered it to 2 min. 17 sec. in 1871, and three years later to 2 min. 14 sec. It remained there till 1878, when Rarus trotted in 2 min. 13¼ sec. The following year St. Julien brought it down to 2 min. 12¾ sec., and the next season to 2 min. 11¼ sec. In 1880 Maud S. was crowned queen of the turf with 2 min. 10¾ sec. on her banner, which she reduced to 2 min. 10¼ sec. in 1881. For three years she was without a peer. In August, 1884, she was dethroned by Jay-Eye-See, who scored a mile in 2 min. 10 sec. But only for twenty-four hours. The next day Maud S. trotted in 2 min. 9¾ sec., and in 1885 she made her record of 2 min. 8¾ sec., which has never been beaten. From this review it will be seen that the trotting record has been reduced just eleven seconds in thirty years. But the development of the trotter is only partly illustrated by a comparison of the achievements of these two horses. During the reign of Flora Temple there was but one two-twenty trotter. Now there are scores of them. To what is this development of trotting speed due? Various causes. First, breeding, to which more thought, enterprise, and capital have been given every successive year. The horse itself

has thus been greatly improved. Then it has been greatly helped by artificial means. The track of to-day is "faster" than the old-time course. It is a mile instead of a half-mile, elliptical instead of round, and with greatly improved footing. A sulky now weighs forty pounds. It used to weigh eighty to a hundred. Then there are toe weights and special shoes designed to balance the trotter in his gait, boots, and other appliances to protect his feet and legs. Corresponding improvements have been made in harness, reins, and bits. Finally, a higher degree of skill has been attained in training and driving, all of which have combined to increase the speed of the trotter.

HORSES AND MUSIC.—Says a report by German scientists: "The investigations as to the musical sense of horses have shown that that sense is very poorly developed in these animals. It has been proved beyond doubt that horses have no notion whatever of keeping time to music, and that at circuses they do not dance according to the tune, but that the musicians have to keep time according to the steps of the animals. Other investigations show that horses do not understand military trumpet signals. It is only the rider or the animal's instinct of imitation which induces horses to make the moves required by the signal, but no horse without a rider, however carefully trained, takes the slightest notice of a trumpet signal, and the same observation has been made on a large number of cavalry horses without riders."

DIPHTHERIA FROM DOMESTIC ANIMALS.—Dr. Robinson, in his report to the sanitary authorities of the East Kent Joint Committee, writing on the communicability of Diphtheria, says: "At one isolated farmhouse the disease was concurrent with disease amongst the farm stock, with this further coincidence that, on the occasion of a prior outbreak of the disease at the same house, the cattle were also concurrently affected. The first case in another out-of-the-way hamlet was that of a boy who had been feeding dogs with the carcase of a diseased cow. In one outbreak there was a sudden explosion of the disease confined almost, if not entirely, to the consumers of milk from a particular dairy; and, on inquiry at this dairy, it was found that three cows had been ill, two of which had been disposed of by slaughter. At another locality where the outbreak was limited to two children in the same family, the father of the children had previously had care of a horse suffering from ulceration of the nostrils. Experiment has demonstrated that Diphtheria can be communicated to the lower animals, and, if conveyance from the lower animals to man occasionally takes places, some of the isolated outbreaks, hitherto unaccounted for, may have risen in this way."

A MASSACRE OF CATS.—A terrible carnage of cats has been organised at Corbeil, not far from Paris. Two persons living in the town were bitten by a local "tabby," which was declared rabid by a veterinary surgeon, whereupon the destruction of the town pussies *en masse* was decreed by the inhabitants. It is to be hoped, however, that the people who have organised the massacre will be brought to their senses before they pave the way for a plague of rats and mice—a contingency to which their present wild and extraordinary conduct would seem to point.

TYPHOID FEVER IN DOGS.—Dr. J. R. Roberts, of the Indian Medical Service, has published in the *Indian Medical Gazette* (June, 1889) an interesting note on the occurrence in dogs of lesions resembling those of enteric fever in the human subject. While stationed at Sialkot during the last cold weather, he was led, by the occurrence of a heavy mortality among dogs of European breeds, to make a series of *post mortem* examinations. In a certain proportion of cases he found the following coincident lesions: (1) an enlarged, dark-coloured, friable spleen; (2) swollen, inflamed mesenteric glands; (3) large oval ulcers in the ileum; (4) swollen oval patches; (5) points of sub-

mucous hæmorrhages; (6) large intestine with submucous hæmorrhages along the crests of the longitudinal rugæ seen in the dog; (7) inflamed vermiform appendix. The animals presenting these lesions had suffered during their illness from continued indisposition, increasing debility, distaste for food, vomiting, and stools which, if passed by a human patient, would be at once pronounced typhoid, though this was by no means invariable, as constipation might be present. The temperature might be high—in one case it was 104·5°—but temperature in dogs, though normally about 100°, can easily be raised to 103° or higher by exercise. About four years ago Mr. Bland Sutton communicated to the Pathological Society of London a paper on the occurrence of a disease in monkeys and in beavers, which he identified with the Typhoid Fever of man; he also observed the lesions in a tiger in a solitary case. The only symptoms observed during life were diarrhœa and hæmorrhage, but it was not possible to make careful clinical observations. He pointed out that M. Serres had recorded the occurrence of Typhoid Fever in monkeys, dogs, and cats, and had made some extended observations during an epidemic which occurred among the monkeys in the Musée d'Histoire Naturelle, in Paris; the symptoms observed were diarrhœa, increased frequency of pulse, and fever, ending almost always in death. Dr. Roberts suggests that if further examination should prove that dogs, as he suspects, are liable to Typhoid Fever, that fact would help to explain the continued prevalence of the disease in Indian cantonments, in spite of the sanitary precautions taken.

Dangerous Hydropathic Treatment.—A curious scene was lately witnessed on the beach at Folkestone, Kent. A man, apparently a dealer or carrier, took down a somewhat infirm-looking horse for the benefit of a sea-bath. As the animal did not seem to relish the idea of cold water externally applied, the owner carefully muffled up not only the eyes but the whole head in a kind of bag. The end of the halter was then given to some people in a boat, who towed the unhappy creature into the briny deep. Before many minutes had elapsed the bag got wet, and poor Rosinante was effectually suffocated, and sank to the bottom like a stone.

The Dresden Veterinary School.—By a royal decree, this school has been raised to the grade of a university (*Hochschule*), like those of Hanover and Berlin.

Sustenance Requirements.—Experiments show that for mere sustenance a cow of 1,000 lb. weight must digest about 8 lb. of nutritive material from her food, to supply which the food must contain about 17 lb. of dry organic matter.

Transport Damages.—During the year 1888 no fewer than 2,666 animals were thrown overboard, 169 were landed dead, and 1,113 had to be killed on landing, from injuries they had received, in connection with the foreign cattle traffic from Canada and the United States to this country.

Cancer and Age in Animals.—An instructive monograph on tumours in the lower animals, by Dr. Plicque, appeared recently in the *Revue de Chirurgie*. Amongst the more interesting definite facts included in his paper, are the subjects of Melanosis and the relation of Cancer to age. Melanosis, so malignant in man, is far nearer the innocent type of tumour in animals, especially in the horse. A melanotic nodule on a spot subject to irritation by harness sometimes disappears when the harness is adjusted so as to rub the new growth no longer. This phenomenon has even been observed after the growth has begun to ulcerate. Other tumours, especially Sarcoma and Carcinoma, are often more intensely malignant in animals, especially the horse, than in man. Animals protected by the resources of civilisation, so as to

live to an old age, rarely, if ever, met with in nature, are especially subject to Cancer. Indeed, Dr. Plicque finds distinct evidence that age is far more predisposing to Cancer in beasts than in man. Bouley, a great French veterinary authority, believed, on the ground of long observation, that dogs are doomed to Cancer if they live to old age and are not killed by some acute pulmonary or gastro-intestinal affection. The cat, often cherished and kept alive when old and miserable, is also very subject to Cancer in age. Statistics show that Cancer is far more frequent in the carnivora than in vegetable eaters. This statement, as Dr. Plicque is careful to explain, is liable to mislead the pathologist; indeed it is a capital example of a statistical doctrine eminently calculated to deceive the thoughtless. For, if we only note what animals are mentioned above in this paragraph, the truth will become apparent. Old cats and dogs, carnivorous animals, are kept alive through a somewhat misguided philanthropy or rather zoophily. But an old horse is seldom favoured in this doubtful way, and cattle are killed, or ought to be killed, when they are young and tender. The herbivora have little chance of living long enough to have Cancer.

A Snake in the Body of a Calf.—A short time ago Mr. John Hammon, salesman, of Stanford, bought a cow and calf of Mr. Bowes, of Elham, Kent. He subsequently noticed that the calf was doing badly, and it seemed as if it was dying. He gave it a dose of medicine, and to his astonishment and that of others who were attending the calf, a dead snake, nearly three feet long, came from the animal. The calf is now alive and doing well. It is supposed that while the calf was lying down the snake was attracted to its mouth by the milk it had been sucking and was swallowed.

Prussic Acid from various Plants.—Besides bitter almonds and laurel leaves as sources of prussic acid, M. Lorissen has recently found that a very large number of plants, belonging to no less than *fourteen* different families, and including species of *Arum, Poa, Ribes, Euphorbia, Vicia, Ricinus, Lucuma, Chardinia, Ximenia, Rhamnus, Aquilegia,* and several others, are capable of yielding notable amounts of prussic acid when distilled with water. Hitherto this fact has been entirely overlooked by chemists.

Professor Perroncito.—We have much pleasure in announcing that the eminent Italian veterinarian, Professor Perroncito, whose name has been so closely associated for many years with investigations into the parasitic diseases of animals, has been appointed to the Chair of Parasitology in the University of Turin.

Professor Lafosse.—The Academy of Medicine of Paris has honoured itself, and conferred honour on the veterinary profession, by electing to membership Professor Lafosse, late director of the Toulouse Veterinary School, and author of a remarkably able and extensive work on veterinary pathology.

Veterinary Research in Italy.—The Italian Minister of Agriculture, in conformity with the proposal made by the Commission appointed to inquire into animal diseases, has granted to the veterinary schools of Turin, Naples, Pisa, and Modena, the funds necessary to enable teachers in these institutions, and who are members of that Commission, to initiate or to continue studies or researches with regard to obscure infectious diseases.

Academie des Sciences of France.—In the *Seance* of July 1st, the French Academy of Sciences elected as National Correspondent in the Section of Rural Economy, Professor Arloing, director of the Lyons Veterinary School.

Rabies in Turkey.—It was for a long time believed that Rabies was un-

known in the East, and especially in Asia Minor. In "Rabies and Hydrophobia" we offered evidence to prove that this was not so, and since that work was published further proofs have been accumulating to show that, though perhaps rare, the disease is only too well known. Zœros-Pasha has, in fact, established an anti-rabaic institute at Constantinople, with the object of protectively inoculating, after Pasteur's method, persons who have been bitten by rabid dogs. Already forty-one people have been so treated, and of these thirty-eight were assuredly wounded by mad dogs; not one of these persons has died. Four of them were bitten by dogs which bit other persons; the former are alive and well, while the latter have succumbed to Hydrophobia.

Correspondence.

SKIN DISEASE IN QUEENSLAND.

SIR,—I read with much interest in your Journal for March last, a paper by Mr. Haslam on an equine skin disease in India, and which appears identical with a disease exceedingly prevalent in horses and cattle in this colony, extending over an area of more than a thousand miles in length of all the land having a watershed to the sea-coast, and extending towards the interior of the colony, in some cases 500 miles. As in India, the disease is very difficult to cure; and although it yields, temporarily to various applications, it, in a very large majority of instances, reappears in the same animals with a return of the humid weather in the following summer.

A Board was appointed by the Government last year to inquire into the disease, and I forwarded to you a copy of that Board's report, which, however, you did not publish. I forward by this mail another copy of the report, in the hope that you will at least summarise it if you cannot find space for it in its entirety.

The importance of discovering a permanent cure, easy of application, will appear when it is explained that at least a hundred thousand horses and half a million cattle are suffering from it in this colony and New South Wales, and that a majority of these are running wild, in a state of nature; hence the difficulty of applying any remedy in a very large majority of cases.

The injury caused to the hides by the disease is such as to cause serious loss to tanners.

I may state that it disappears in the winter months—June to October—but only to reappear in summer, as above stated.—Yours respectfully,

P. R. GORDON,
Chief Inspector of Stock, Queensland.

ACARUS FARINÆ IN ONE FORM OF PUSTULAR STOMATITIS OF THE HORSE.

SIR,—Mr. Edgar in his excellent paper on "Some Contagious Skin Diseases of the Horse," in the VETERINARY JOURNAL for August, has called for further explanation from me regarding the nature of the acarus I noted in one form of Pustular Stomatitis among horses when stationed at Woolwich some years ago, and subsequently in India. I will briefly state that my acquaintance with this parasite leads me to these conclusions, viz. :—

That, although I had the anatomical features of the acarus to guide me, and of which I gave as fair a representation as I could on paper, I was not then sufficiently conversant with the classification of acari to be able to suggest a designation for the one I had before me, beyond saying that it was an acarus (VETERINARY JOURNAL, 1882).

Coming across the same parasite, in the same disease, some years later,

when I was in India, led me to inquire more closely into its characters. In all our veterinary text-books I could find no description of the acari to tally with the appearances presented by that I had before me. I naturally turned to what few medical books I had in my possession, and here I found that in shape of head, body, and in the number of joints possessed by each limb, the organism I was dealing with was similar to the *acarus farinæ*.

I examined some bran then supplied to the horses, which was musty-looking, and found the same acarus present in it. Why the acarus found in the bran supplied alike to all the horses was seen to give rise to the disease (Pustular Stomatitis) in one or two only, and not in the rest, I am unable to explain; and I agree with Mr. Edgar in thinking that "the presence of acari upon the skin does not in itself constitute disease," and would add that, the detection of the acarus in the disease on two different occasions, together with its association with the bran used for the horses as noted by me, suggest at least one thing, that we cannot continue to issue bran containing these acari to the horses when cases of Stomatitis are reported in which similar acari are found.

R. W. Burke, M.R.C.V.S., A.V.D.

Camp, Glenbeigh, Co. Kerry, Ireland.

MENSTRUATION IN ANIMALS.

Dear Sir,—From the study of comparative menstruation, we are easily led on to consider the comparative male generative functions. It seems to me that man and some of the lower animals, on account of civilization and other causes, are in a peculiar condition as regards their sexual passions. Undoubtedly, many men are prevented, by sundry considerations and circumstances, from indulging their natural sexual desires. It is well known that such people are subject—provided they are healthy—to occasional seminal discharges during sleep.

It occurred to my mind to endeavour to satisfy myself as to whether the lower animals are also subject to these involuntary seminal discharges. Men who sleep in rooms above stallions' stables state that these animals will sometimes, in their dreams, make noises and become excited in a manner similar to their performances just prior to copulation; but whether there is any discharge of semen they are unable to say.

I have seen a bull, which was constantly kept with *only* four cows, have erections of the penis and a subsequent discharge of fluid, which I *believed* to be semen.

Dogs of mine have shown, occasionally, great sexual desire, as evidenced by staying away from home for two or three days consecutively; and I have afterwards discovered that they were paying their attentions to some bitch on "heat." Frequently I have seen these animals dreaming. But whether there was any discharge of semen I am unable to state.

The vesicules seminalis in the lower animals must become overcharged with semen, and if it is not expelled in the same way, as with man, what becomes of it?

Methinks if young men—veterinary students included—could believe and realize the awful consequences of syphilis, of two evils—prostitution and involuntary seminal emissions—they would choose the least.

Proceeding now to a few remarks in reference to menstruation:—

It seems to me that all animals, woman included, have periods more or less varied of menstruation.

To me it seems a very interesting fact that at a very early embryonic period, both sexes possess true male and female glands.

I am making enquiries as to menstruation in mules, but I must honestly admit that I know very little about these animals. Perhaps some of the readers

of the VETERINARY JOURNAL would kindly assist me by giving information through that medium, as to this subject of menstruation in the mule.

Kangaroos seem to be gradually passing from the primary—if it was primary—hermaphrodite condition to the *ordinary* generative condition of mammals. They appear to possess inferiorly evolved sexual organs. Surely it would be hard to find a more peculiar and interesting fact than that connected with the mode of transference of the immature embryo to the marsupial sac, occurring, as it does, about thirty-eight days after impregnation.

Also, it is interesting to remember that kangaroos resemble birds, in having only one orifice for the exit of fæces, urine, and generative products.

Whether, in the spawning of fishes, egg-laying in birds, the "heat" or "rut" of the lower animals, or the menstruation of the human being, ovula become developed and are shed, whether they be fructified or not, we cannot help coming to the conclusion that the period of heat is perfectly analogous to the period of "menstruation." Such is the purport of a letter written in a former article in the VETERINARY JOURNAL, and with the writer I thoroughly agree.

It has been ascertained that in the higher monkeys, when they do not suffer through captivity, the menstrual flow is almost—sometimes quite—as copious as in women, and is of a similar character.

But that later "change" which takes place in women has not, so far as I know, been carefully noticed in the lower animals.

I refer to the time, generally between the age of forty-five and fifty, when she ceases to have the usual monthly flow.

It may have been noticed in our subjects, but it seems to me that it does not produce such a marked effect upon them as in the case of women.

"SELF-RESTRAINT."

FOREIGN AND COLONIAL PRACTITIONERS.

SIR,—In the report of the meeting of the Royal College of Veterinary Surgeons held July 1st, 1889, the question of recognition of colonial and foreign colleges was brought forward by the President. He is reported to have said, that as soon as a school was recognised the College would be compelled to recognise graduates of that school on the payment of five guineas as a registration fee. Now this matter requires careful consideration, and as I have some knowledge of foreign and colonial schools, I think it only right to draw attention to the fact that although some of the schools have their teaching and examining bodies up to a fair standard, still, before graduates be permitted to practise in Great Britain, they should be compelled to pass the final examination of the R.C.V.S., which, if they are not able to do, they certainly are not entitled to be recognised.

In human medicine certain foreign and colonial colleges are recognised, but before their graduates are permitted to practise in Great Britain they must pass the examination of one of the licensing boards. The same rule might be applied to graduates of veterinary colleges when the Council is satisfied that the period of study prescribed is adequate, and the Matriculation and other examinations are sufficiently stringent.

I may remark that consulting the prospectuses of the colleges is not sufficient evidence, and more information is required before the first and second examinations are allowed off.

Some of the foreign and colonial schools only require two sessions to qualify, and the matriculation examination would be an insult to a young school-boy; the practical examination does not come near the standard of the R.C.V.S., and in some there is no practical examination at all. The numbers who receive licences to practise every year are very large; and

certainly if the Royal College is to recognise these graduates, the result will be that students in this country who fail in their final examination will "go across the water," and return armed with a diploma from one of these "recognised colleges." Apologising for taking up so much of your valuable space.

A PRACTITIONER.

EXPERT WITNESSES.

DEAR SIR,—In reading the letters in the *Daily Telegraph* in reference to the great criminal trial of Mrs. Maybrick I noticed a remark from one of the correspondents. He said there might be "expert" witnesses called by the Crown, and they not being interested either for the prosecution or defence, their evidence could not be said to be influenced by selfish motives. It seems to me and that in veterinary jurisprudence as it exists at present witnesses are often made to take the place of advocates, consciously or unconsciously. I think the idea is a good one, but whether novel or not I am unable to say.

EXCELSIOR.

PROFESSIONAL ADVERTISING IN IRELAND.

SIR,—Permit me, through the medium of your valuable Journal, to draw the attention of the veterinary profession to a form of advertising at present being carried on by a recently qualified M.R.C.V.S., in a provincial town in Ireland, and which, to my mind, is the most novel and disgraceful I have heard of. It consists in a regular system of not only circulating hand-bills in the market-place, but of pasting them on the backs of farm carts, etc., and thereby converting them into "travelling advertisements," or whatever other epithet your readers may choose to apply. Now, while I don't think that the members of our profession should be prohibited advertising, in a proper manner, I do think it is to be deplored that any member should demean himself in resorting to a practice, which must be more or less degrading to the profession as a body. Apologising for occupying space with what may appear a trifling matter to some.

"MEDICUS."

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from R. W. B.; J. A. Nunn, A.V.D., India; "Self-Restraint;" P. R. Gordon, Queensland; J. H. Steel, A.V.D., Bombay; R. W. Burke, A.V.D., Ireland; "Excelsior;" "A Practitioner;" J. Brett, Mansfield Woodhouse; W. F. Greenhalgh, Leeds; Prof. McCall, Glasgow; "Medicus;" H. Kidd, Hungerford.

BOOKS AND PAMPHLETS: *S. Arloing*, Le Berceau de l'Enseignement Vétérinaire; *L. Brusasco*, Trattato Teorico-Pratico di Materia Medica e Terapeutica Veterinaria; Recueil de Mémoires et Observationes sur l'Hygiene et la Médecine Veterinaires Militaires; Nouveau Dictionnaire Pratique de Médecine, etc., Vétérinaires; Procès-Verbal de l'Académie Royal de Médecine de Belgique.

JOURNALS, ETC.: *American Journal of Comparative Medicine and Surgery; Journal of Medicine and Dosimetric Therapeutics; Bulletin des Séances de la Société Nationale d'Agriculture de France; Journal of the National Agricultural Society of Victoria; Russian Journal of Veterinary Medicine; Lancet; Journal de Méd. Vétérinaire et de Zootechnie; Annales de Méd. Vétérinaire; Wochenschrift für Theirheilkunde und Viehzucht; Clinica Veterinaria; Echo Vétérinaire; Mark Lane Express; British Medical Journal; American Live Stock Journal; Revue Vétérinaire; American Veterinary Review; Edinburgh Medical Journal; Recueil de Med. Veterinaire; Thierarzt; Hufschmied; Live Stock Journal.*

NEWSPAPERS: *Edinburgh Evening News; Sandgate and Shorncliffe Herald; Cork Examiner; Cork Constitutional; Keble's Gazette.*